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Tire Outlook Promising

AT THE beginning of the year leading automobile makers declared that about the best they could expect of 1924 would be that it would equal the output of 1923. But, if present indications are not misleading, the chances are that production for the current year will decidedly outstrip that of last year. To accomplish this it will only be necessary for the total of the first two months of 1924 to bear the same ratio to this year's total that the joint production of January and February, 1923, bore to the entire output of last year. In other words, instead of the "possible out-turn of 4,500,000 cars," which the "saturationists" reluctantly concede, it seems very probable that total production for 1924 will be over 5,000,000 cars, as compared with the 4,200,000 cars that were produced in 1923.

What does all this mean to the rubber industry, and particularly to the tire division? Assuming that on January 1 there were 15,000,000 cars in use (total registration for the United States in 1923 being 15,222,658), and as 2.7 casings per car are estimated by Akron manufacturers for this year's replacements, such vehicles would thus require 40,500,000 tires. The 5,000,000 new cars would need four apiece and a spare, making 25,000,000 more; and 1,000,000 may be allowed for export. Thus a total production of 66,500,000 tires would be indicated for 1924, as compared with an outturn of 45,000,000 for 1923. This reckoning takes no account of the probable discarding of at least 1,000,000 good cord tires by car owners who must try the new balloons.

When to the foregoing total of tires is added a likely out-turn of 65,000,000 inner tubes, with a corresponding increase in the volume of various rubber accessories it appears reasonable to conclude that during the present year the rubber industry is likely to enjoy a very fair degree of prosperity.

Crêpe Sole Propaganda

THERE is that about rubber crêpe products that seems to so bias the producers' judgment that the most unwarranted conclusions are entertained and widely acted upon. The crêpe creed expressly and dogmatically calls for "100 per cent pure rubber subjected to no treatment which impairs the natural live quality and nerve of rubber,"—in other words, no washing, compounding, calendering, curing. The rubber manufacturer is eliminated and the planter or his agent ships to the distributer. In the case of the crêpe sole the goods are to go to the leather shoe manufacturers direct. Here, to the mind of the planter, is a huge market to be opened by the right sort of appeal to the public. Thus come the advertisements of the Rubber Growers' Association in American periodicals reaching millions of sole wearers, and designed to react upon hundreds of footwear makers. That this effort will draw fresh attention to the sole for sporting shoes is certain. That it will result in its adoption for regular wear, masculine or feminine, is not to be expected. Moreover, unless the prices for crêpe soles and heels are reduced by about one-half the repair shops that do most of the heeling and soling will soon cease to handle them.

If one examines the crêpe soling on the market the "100 per cent pure rubber" is disproved. Some of the crêpe has been vulcanized.

Often it carries a strong odor of naphtha and sometimes its extra velvety softness suggests substitutes. In other words, all rubber manufacturers will not let such profitable chances go by to get their share of the sole market. They will make their own compounded crêpe rubber sole; and the best will be better than the plantation

product, the worst will look so well and be so bad that it will seriously injure the sale of all. This in part is why we feel that the exploiters of the crêpe sole have been misled by their own desires. We wish heartily that it were otherwise and that their efforts could open a market for millions of pounds of pure rubber.

Tax Problems in Planting

TIME was when the rich man intrenched in feudal fortress taxed and supertaxed the laborer, merchant and all who had anything taxable. Today the laborer taxes and supertaxes employer, capitalists and all men of substance. In days of yore the overtaxed emigrated or rebelled; today the overtaxed seek exempt securities and avoid expansion and new enterprises. With the present temper of taxation laws, where new enterprises are planned, present and future tax conditions need to be most carefully gone into before anything else is considered. Thus there are a score of countries where Hevea will thrive and where labor is available. All or nearly all place a definite tax upon crude rubber. This varies from a fraction of a cent a pound to as much as 40 per cent ad valorem. Even where plantation rubber is tax free there is no assurance that it will not one day bear a heavy duty.

Of all the tropical countries, including the Philippines, the only ones where the American planter would enjoy practical freedom from taxation, present and future, are those under British control. When the Sumatra plantations of the United States Rubber Co. were in process of formation John J. Watson, Jr., said:

"I am doubtful only regarding the Dutch attitude toward Americans in the matter of taxation. They may find it expedient to extort more than we anticipate."

This forecast was thoroughly sound. In a paper read before the American Academy of Political and Social Science in March of this year H. Stuart Hotchkiss, president of the United States Rubber Plantations and its subsidiaries in Sumatra and the Malay States, said:

"In British Malaya there is only one tax and this is a very moderate export tax. This has always been based on a sliding scale of rubber values and even under the Stevenson Act it amounts to a little less than a British penny per pound on the normal amount of rubber permitted to be exported. In the Dutch Territories there is an export tax too, although little has been said about that. The Dutch, aside from their export tax, have excess profit taxes, income taxes and in one instance in our experience we have known them to resort to retroactive taxation, which is as unmoral as it is unsound. No one hears about Dutch or Brazilian methods because unfortunately there is a substantial element in our press and public with whom it is popular to criticize Great Britain whether right or wrong."

All of the above is wholly without prejudice and should lead planters to be as familiar with governmental practice as they are with soil, rainfall, and labor before they locate.

Factories and Universities

SCARCELY any need of our modern business life has been more urgently emphasized in these columns than that of a closer understanding, if not a warm accord or an actual working agreement, between the nation's industrial and educational forces. It has been repeatedly pointed out that if American manufacturing interests are to even hold their own with competitors in foreign fields, much less retain general supremacy in the commercial world, they must realize that even the production of superior goods and exceptional enterprise in marketing, highly essential as both factors are to success, will not insure commanding position. They must be supplemented, or rather reinforced, with the special training of an ample number of minor and major leaders for leading industries.

The United States census showed that in 1920 of the 41,614,248 persons then gainfully employed only 1,510,129, or 3.6 per cent, planned the activities and directed the occupational energies of the 96.4 per cent. In 1870 the proportion of administrators, supervisors, and technical experts was but 1.25. In 1900, when the era of large scale production began, it had risen to 2.46. What may it or should it be in 1930? A census estimate, taking little account of the increasing complexities of business, would put the 1930 need close to 4 per cent; but the chances are that in 1930 this requirement will be between 4½ and 5 per cent. Even an army maintains a ratio of 4 per cent of officers.

The manner in which engineering schools can help to meet this exigent need has already been pointed out; but we cannot be content even with their valuable aid. The active cooperation of most of the higher institutions of learning could and should be enlisted in enhancing the success of industrial mass production. It is a vital, extensive, present-day problem in which great schools, through endowments and in other ways, are and must be increasingly concerned. The industries need numerous technical college graduates. If the latter have a more liberal education they are doubly welcome.

WE DO NOT PARTICULARLY APPROVE THE WORK OF THE headliner of the Rubber Growers' Association as shown in their *Saturday Evening Post* crêpe sole announcement. In all kindness, is their phrase "The Immortal Sole" one that appeals to Americans? We are, to be sure, on the surface careless, unthinking and often irreverent. Nevertheless there is in us a basic reverence that balks at the use of terms sacred to even a minority. Words and phrases pertaining to creed, church or religion are rarely employed to sell goods and then only by the sensation seeker. It may be good advertising, perhaps, but the originator of the line has a false idea of Anglo-Saxon reactions.

"BUY THE TRUTH, AND SELL IT NOT; ALSO WISDOM, and instruction, and understanding." Proverbs, 23:23.

Rubber Street Pavement Laid in Boston

Boston, Massachusetts, Becomes Pioneer American City To Try Out Rubber Paving Blocks—The Racine, Wisconsin, Railroad Crossing Experiment and the Harvard Bridge Project.

BOSTON, MASSACHUSETTS, became the first large American city to try out rubber pavements when early last month the first rubber pavement for street purposes in America was laid on a bridge in the commercial district. Although trials in England antedated it by many years, this first experiment in this country was conducted with paving blocks of American invention and manufacture.

Day Baker's Efforts in Boston

For the past three years Day Baker, chairman of the Legislative Committee of the Massachusetts Automobile Dealer and Garage Association, has been constantly working with the city authorities and rubber manufacturers with the idea of introducing rubber street and bridge pavement in America. Discovering that the Wright Rubber Products Co., Racine, Wisconsin, possessed a patent which would make rubber paving blocks practical, he conceived and urged the idea of saving and repairing Harvard Bridge by the use of rubber pavement,[1] a project which, in the light of recent legislative events, seems to have good promise of fulfillment. The experiment now being conducted with the cooperation of Clarence Wright, head of the Wright company, is a step toward solving the Harvard bridge problem.

Through Mr. Baker's efforts Mayor James M. Curley, Commissioner of Public Works Joseph A. Rourke and Street Commissioner John H. L. Noyes became so impressed with the many advantages of rubber paving and its successful use abroad, as recounted at various times in THE INDIA RUBBER WORLD,[2] that they consented to give it a practical trial. The material and labor have been provided by the Wright Rubber Products Co. without expense to the city and the installation work was personally superintended by Clarence Wright, inventor of the paving block. The first block was laid by Commissioner Rourke in the presence of several city officials, paving experts, and numerous interested individuals, including a representative of THE INDIA RUBBER WORLD. Clarence Wright laid the second block and Day Baker the third.

Section of Rubber Pavement Laid on Northern Avenue Bridge, Boston, Massachusetts

The Try-Out on a Drawbridge

The site selected for the experiment was the draw of the Northern avenue bridge, which carries a tremendous traffic of heavy vehicles of horse-drawn and motor-driven types to and from steamship docks, railway freight yards, storage warehouses and manufacturing plants. Approximately 1,000 vehicles per hour cross this bridge in each direc-

World Wide Photos

Day Baker, Clarence Wright and Commissioner Rourke Inspect Blocks

Commissioner Joseph A. Rourke Laying the First Block

[1] "American Rubber Pavement Would Save Harvard Bridge," THE INDIA RUBBER WORLD, April 1, 1923, 416-417.

[2] "Rubber Pavement the World Over." THE INDIA RUBBER WORLD, January 1, 1923, 205-206; February 1, 1923, 288-290.

tion. The planking of this bridge has to be renewed frequently, and it is believed that rubber pavement will have as hard a test there as anywhere else in the city.

Form of Blocks and Method of Laying

Two sections, each eighteen feet square, were laid, one on May 7 in the roadway devoted to horse-drawn vans and the other on May 14 in the motor roadway in the center of the bridge, a total of nearly 650 square feet. The paving is in blocks six by twelve inches and one inch thick. It is specially compounded of about one-third new rubber and two-thirds reclaim, and in vulcanizing the blocks are subjected to 333 degrees heat and 2,500 pounds pressure.

The great difficulty in the way of success of rubber block pavement abroad has been the inability to keep the blocks down and to prevent them from creeping. Cementing to the foundation would not accomplish the result. The Wright paving blocks are constructed with two semi-circular flaps on one side and one flap on one end of the base of the block, which fit into corresponding recesses in the base of the adjoining block. This is a development of the patented interlocking feature of Wright rubber floor tile. Special spikes are driven through holes in the flaps into the smooth, new bridge planking, or the special device used for concrete road foundations. The blocks are laid one block plain and the next corrugated in hot rubberized cement, uniting the blocks together and to the foundation, making a water-tight roadway over the street or bridge foundation.

The speed and accuracy with which this rubber pavement can be laid was exemplified by a crew of four bridge mechanics, a cement pourer, cement layer, paving block placer and a spiker, who laid the first few hundred at the rate of sixty square feet per hour.

City Officials Enthusiastic

The rubber pavement as laid presents an excellent appearance, and those who are qualified to judge in regard to paving projects are enthusiastic about it. The first section of rubber pavement laid has been in constant use for nearly a week, and much to the surprise of all observers, the sharpest horseshoe calks and heavy steel tires leave no scratch, indentation, or other mark on the pavement.

As the horses and vehicles pass over the rubber paved section, the lack of noise is at once noticed, thus showing the desirability of this class of pavement for bridges and quiet zones in streets around hospitals and other institutions, particularly residences and high-class office buildings.

Although rubber pavement costs about three times as much as wood block, it is claimed by those who have studied its qualities that it will last many times as long, probably twenty years or more, and in the long run prove a saving to the taxpayers of the city. Rubber pavement laid in the courtyard of the St. Pancras Station in London, England, in 1870, is still down, and has worn down only 3/16-inch in fifty years. In addition to being quiet it is claimed that rubber pavement is not slippery either for horses or motor vehicles. Its peculiar ability to absorb shocks and diminish vibration will not only save wear and tear upon all vehicles passing over it, but as applied to bridge work will greatly extend the life of costly steel structures.

Future Prospects in Boston

If the Northern avenue bridge experiment proves successful, other bridges and streets in various parts of the city will be similarly paved, according to tentative plans. The present budget sets aside an appropriation of $100,000 for rubber streets. It is likely that the next trial will be on the Warren avenue bridge which now has three new surfaces of wood planking a year, and when the present legislative tangle concerning Harvard Bridge is straightened out rubber paving may for a long period of years effectively silence the discordant rattle of this so-called "xylophone" bridge.

The Racine Railroad Crossing Experiment

The first rubber block pavement in America was laid last summer in Racine, Wisconsin, on a crossing of the Chicago, Milwaukee & St. Paul Railroad located on the main highway, known as Route 15, between Chicago, Illinois, and Milwaukee, Wisconsin, which is used by thousands of automobiles and heavy motor trucks every day.[a] It was developed for the railroad by the Wright company, but for that special purpose differs somewhat from the street paving laid in Boston. This crossing pavement has now been in use for nine months and looks just as good as the day it was laid. In fact, the corrugations on the tops of the blocks, which were only a few thousandths of an inch thick can still be seen. Two similar sections are about to be installed.

With the notable success which rubber paving has achieved in England and the advance in form of construction made by American inventors, it is believed that rubber paving will now take its proper place among paving materials in this country, developing a market for scrap automobile tires which are now almost unsalable.

[a] "Rubber Pavements Come to America." THE INDIA RUBBER WORLD, November 1, 1923, 77-78.

AMERICAN SOLID TIRE EXPORTS INCREASE

Exports of American-made solid tires show a steady increase in values for the last three years. In 1921 the total exports from the United States of such commodities were valued at $1,300,081, the figures rising in 1922 to $1,518,932, while in 1923 the total was estimated at $2,376,235.

The leading consumers were: England, taking in 1923 goods valued at $626,585, as compared with only $188,146 in 1922, and $144,325 in 1921; Australia, at $303,539 in 1923, as compared with only $125,242 in 1922, and $16,959 in 1921; and Japan, whose importation reached $150,226 in 1923, as against only $35,382 in 1922, and $34,546 in 1921. Although Cuba represents another important customer, taking in 1923 a purchase of solid tires valued at $211,380, as against $196,391 in 1922, the 1923 figures were considerably below the corresponding ones for 1921, the latter being $223,845. New Zealand represents another country where great increases have been made along these lines, the 1923 value for solid tires of American make being $187,846, almost double that for 1922, at $96,400, the 1921 figures being only $56,139. Certain other countries, although taking smaller quantities of goods, made correspondingly great advances.

TIRE EXPORTS—FIRST QUARTER 1924

During the first quarter of the present year the leading purchasers of American automobile tires were: England, taking in January goods valued at $161,990, in February, $93,723, and March, $171,809; Japan, with January importation valued at $130,266, February, $117,328, and March, $67,924. Argentina took in January goods valued at $44,933, in February, $133,974, and in March, $80,992.

England and Japan were also foremost as customers for American solid tires, the former taking in January goods valued at $144,783, in February, $61,685, and in March, $63,771. Japan's importations of these tires in January totaled $57,179, in February, $29,174, and in March, $41,098. Australia's purchases in January of solid tires were estimated at $24,089, in February, $19,892, and March, $36,763.

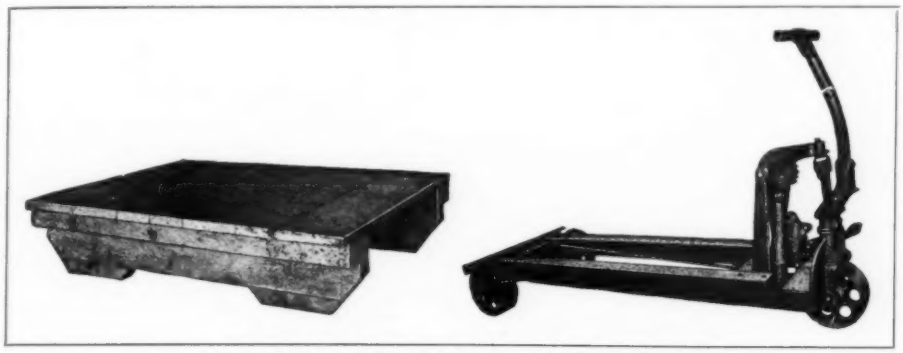
POOR ROAD CONDITIONS IN ARGENTINA, EXCEPT IN THE BUSINESS districts of the larger cities, are responsible for the prevailing use of solid tires, practically all truck tires, and many for automobiles, being of this variety.—*Firestone News Service.*

Trucks and Tractors in the Rubber Factory

Lift Trucks—General Usage—Electric Trucks and Trailers—The Track System

THE FUNCTION of trucks and tractors both mechanically and manually operated is to move the bulk of various units of raw, semi-processed, and finished material from one department to another at the required rate of speed and to store them economically. The solving of this problem, which is essentially a traffic one, means a great deal in the efficient operation of rubber factories of all kinds.

Three general types of this equipment will be discussed in this article, namely: the lift truck, the electrically operated truck with trailers, and the track and turntable system.



Lewis & Shepard Wood Platform and Jacklift Truck

The successful operation of these methods depends first of all upon adequate aisle space. Many factories with up-to-date equipment in the way of machinery and buildings have been handicapped because due consideration has not been given to providing space for the operation of trucks in conveying the material from machine to machine and from department to department. The ideal method is to lay out the productive units so that all traffic moves in one direction. But this is not always possible. If two-way traffic is a necessity aisle space must be wide enough to allow two trucks to pass without crowding and enough leeway for foot traffic.

Sufficient space must also be provided at the elevator doors so that delays will not be experienced from obstructions of any sort. Considerations of safety alone make it imperative that all aisles and passageways be kept clear at all times. Corners and turns should be avoided as far as practicable.

Lift Trucks

The lift truck and platform is an ideal combination for use in the rubber factory and its general use throughout the trade is due to its adaptability to all kinds of trucking and traffic problems. The minimum lift of one type is 2½ inches, maximum 6 inches, so that the platforms cannot drag and catch on inclines and elevators; it is operated by one man, regardless of the load, owing to its mechanical advantage; the front wheels turn in any direction, saving space; and the lift is straight up and down, eliminating the necessity for "spotting" the load.

The great saving of the lift truck method is in the elimination of several handlings of the material and in the amount of equipment necessary. Material is piled on skids at the machine or loading platform, and when it is ready to be moved the lift truck is inserted under the skid, raised up, carried to its destination and deposited there. The old way of doing this was to deposit the material on the floor, from which position it had to be reloaded onto a truck and then unloaded again at its destination. A more modern way of doing the job was to have a large number of platforms with wheels, on which the material was loaded, but this proved wasteful and unsatisfactory because of the initial expense and maintenance of these wheel platforms and also on account of the difficulty of piling the material on such a contrivance. One lift truck thus replaces both man power and equipment.

General Usage of Lift Trucks

The general uses of these trucks as applied to all rubber factories are in the receiving and storage departments, compound, mill, and calender rooms, and shipping department. The illustration gives a general idea how this type of truck is utilized in handling materials and finished goods. In the compound and mixing departments it is general practice to pile the mixed stock in slabs on skids adjacent to the machines, where it is moved by the jacklift truck to the mixed stock storage room. Here the use of the truck is invaluable, as it is necessary to use the mixed stock in rotation and this makes it imperative to shift it constantly.

Stuebing Lift Truck and Steel Bound Platform

In all varieties of rubber goods manufacture the prompt removal

of waste material is a factor in efficiency. Failure to do this clogs the arteries of production and hampers the workman. This is true in the tire plant at the tubing machine, tube and tread calender, tire builder; in the footwear plant at the upper and sole cutters' bench; at the beam press; in the heel plant in the press-room and the blank cutting machine. The use of the lift truck speeds up the removal of these classes of waste.

The calendering and cutting of soling stock in the footwear plant is a good illustration of a lift trucking problem. The stock is calendered in sheets about three feet long and a foot and one-half wide with five or six trademarks to a sheet. These are booked in cloth containers with a wooden base, or in the cases of heavy or laminated soling are placed on boards without leaves. As the normal speed of the calender produces from 20 to 30 sheets a minute, it is imperative that the calendered stock be removed from the aisle and a load of empties inserted every three or four minutes.

The standard method of handling this problem is to pile the boards or books of stock on skids, which when loaded are taken away by means of a lift truck to the stock floor adjacent to the cutting machines. Here again the lift truck helps to solve a problem. These piles of stock represent many different grades of soling and trademarks of various grades so that they must be arranged in rows by stocks and running dates. In order to keep the sole cutting machines running to capacity the loads of stock must be placed in the cutters' aisle and the empties removed at a constant rate of speed, as a fast sole cutter will cut 3,000 pairs of outsoles a day or 1,000 sheets of stock.

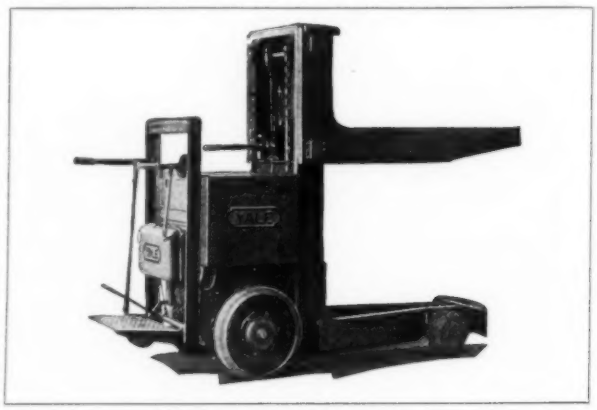
Motorbloc Chain Hoist

The upper cutting room has a similar problem. Here the gum uppers are booked in small light frames with six cloth leaves. As a book will only hold six pairs and one cutter will cut 800 pairs in an eight-hour day, that makes 130 odd books to be taken away from each man. It is accomplished thus: Each cutter is provided with a skid platform on which he piles his finished work and when the trucker comes along the pile is jacked up and taken directly to the making department for delivery. It is not unusual in a shoe factory to see a pile of upper books 16 feet in height conveyed to the making department on one skid via a lift truck.

Lift trucks are invaluable in the reclaiming factory for loading shipments of slab stock and removing finished stock from the sheeting mills to the stock room. They find a use in carton plants for carrying lids and nested boxes to the packing departments direct from the machines, saving rehandling and preventing spoilage. One footwear department has a delivery problem from the preparatory room, where the linings and inside pieces are cemented and inserted in books for the makers. The books are placed in a long rack for the purpose with a groove for the lift truck underneath. At the end of the day a lift truck is inserted under the rack and it is taken to the making room, where it passes from bench to bench delivering the work, after which the rack is returned for the next day's work.

Electric Trucks and Trailers

Electric trucks are used in the larger rubber plants where the hauls are longer and the volume is greater. A tire plant designed for efficient production is constructed on a one-story layout and uses electric trucks with trailers for interdepartment handling of raw materials. They will also be found in use in many rubber plants in Akron, Ohio. When production is organized upon such a vast scale the distance between departments makes it necessary to speed up the handling time. To insure efficient operation of electric trucks the aisle space must be wider than in smaller plants, and the floors be in A1 condition. Brick, cement, and

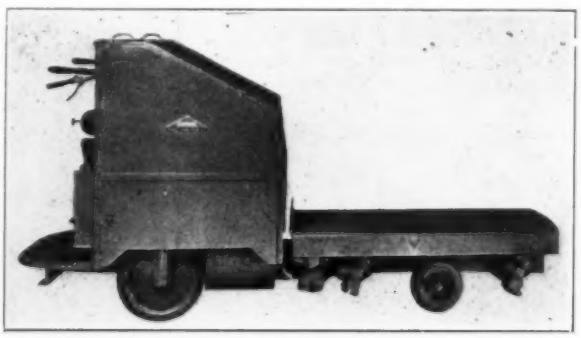


Yale Elevating Platform Truck

wood block paving for floors and alleyways between buildings show about the same amount of resistance, but concrete base with asphalt surface has proven very satisfactory. Much depends upon the care taken of the right of way.

In the large plants using a tractor-trailer system, it is necessary to have a traffic manager who looks out for the scheduling of trips and reduces the back-haul as much as possible. Assuming ten tons as a tractor load, a single machine replaces 40 hand truckers handling 500 pounds each. By proper routing with a drop and pick-up system of trailer trains, a tractor can be kept most constantly in action. For example, in a large tire plant a train might start at the milling department with a load of milled rubber, proceed to the mixing department with it, pick up a load of mixed stock for the stock storage room, leave it, procure a load of calendered treads at the calenders, take them to the tire building department, and return with a load of gum scrap.

It is a good practice to have specified stations in each department for outgoing materials so that the trucks will stop on their regular trips and keep the material moving along. This is much



The Clark Truklift

more economical than having men in each department to do the trucking with one-man lift trucks.

Most large tire plants locate their salvage departments in outlying buildings, where all the papers, refuse, rags, salable and unsalable rubber waste are removed for sorting, baling, and burning. Electric trucks are great money savers in picking up the daily rubbish accumulations of each department and removing them to the salvage station.

The Track System

Whereas the trackless tractor is the latest development in factory traffic, there are places in the rubber industry where the track car is

still used to advantage. The disadvantages of track systems are their rigidity,—that is, they cannot be easily changed to meet changed conditions—and they offer impediments to jack trucks and other types which have to be used in conjunction with them and prevent smooth operation of them. Their advantage is smooth operation, avoiding the jars of uneven places in the floors and exact operation. They are used in footwear making departments for conveying the cars of shoes to the vulcanizers and to the packing room for stripping. These cars are loaded with three or four hundred pairs of shoes racked very close together and the jarring of an uneven floor would cause the unvulcanized shoes to become damaged. In the vulcanizing department tracks are necessary to insure the exact placing of the cars in the heaters and to facilitate the loading and unloading of the heats. Similarly, in the cutting room the doubling drums are operated on a track system, as it is necessary for them to be located at the cutter's bench accurately and quickly. In the tube department racks of wrapped tubes ready for vulcanizing are run on tracks into the horizontal vulcanizers.

It pays for production executives to study their inter-factory traffic problem as there are savings in labor and materials to be made in this field as well as in the actual operations themselves.

Low Temperature Vulcanization

Increasing familiarity with ultra accelerators is gradually leading the rubber industry to displace high temperature cures in favor of vulcanization at low temperatures, because of better economy. Vulcanization is now considered as a chemical and physical compromise between two opposing phenomena: one a gradual change from plastic to elastic material through the combination of sulphur and the action of an accelerator when present; the other, increasing plasticity through the effect of heat. Thus, vulcanization is a compromise between stiffening on one hand and softening, known as depolymerization or devulcanization, on the other.

This conception is important. The force leading to elasticity is the one whose effects we ordinarily observe because they frequently partly conceal those of softening, although the latter are present. For example, the original white tread compounds were cured in 2½ to 3 hours at 40 pounds of steam. They were tough and gave satisfactory mileage, therefore it may not at first be apparent where the devulcanizing action of heat comes in. Nevertheless in this case we must remember that here the stiffening force is enabled partly to mask the softening one because these zinc compounds contained 8 to 12 per cent of sulphur based on the rubber. If the sulphur were reduced to about three per cent or less on the rubber, and the same time of cure maintained, we would not get as good a tread. On the contrary, the product would be so soft that it would never be considered for tire use. The 3-hour heat acts continuously on the rubber to weaken its nerve and fiber, and the sulphur present, were it all combined, is not sufficient in amount to develop the elasticity required to counteract the effect of the heat. With high sulphur the heat, of course, acts upon the rubber aggregate as it does with low sulphur, but its effect is not so apparent.

The old-style compounder, who favored long, low heats and opposed short, high heats was correct, therefore, in principle, because the higher the temperature the greater its weakening action. In this respect temperature is more important than time.

How can this detrimental effect of heat upon rubber be eliminated, and is it worth while to try to do so? For answer, consider briefly the development of acceleration in tire treads during the last 10 or 15 years.

The old white tread above mentioned contained at first no organic accelerator except perhaps aniline. Later the introduction of thiocarbanilide allowed a slightly reduced cure and sulphur content, but it was not until the advent of the black tread that the characteristics of the compound were appreciably changed. First, the use of hexamethylenetetramine and more recently that of diphenylguanidine permitted a marked reduction both of sulphur and time, until now small-sized tires are cured in as short a time as one hour or less at 40 pounds of steam with sulphur content of from 3 to 6 per cent on the rubber.

Doubtless tire treads are better now than they were ten years ago, and while it is true that the greater toughness is imparted by gas black, the accelerators employed constitute the chief cause for this improvement; however, the important cause to note from the standpoint of this discussion is the lessened effect of heat due to decreasing the time of cure.

During the last year or two certain ultra accelerators have come into use which bid fair to advance the industry much further on this line of progress. These differ from the accelerators previously mentioned in certain fundamental respects, namely: (1) They will vulcanize perfectly in a few minutes with a sulphur content of about one per cent on the rubber at temperatures corresponding to ten pounds of steam, or under proper conditions even at the temperature of boiling water. (2) They produce vulcanizates far superior in initial physical and aging properties to the average compound in common use.

The best results are obtained from ultra accelerators when the following precautions are observed: (1) The mill should be neither too fast nor too hot. (2) By a proper selection of rubber and softener, the batch should be plastic enough not to generate excessive heat. (3) The accelerator should be added last to the mixing. (4) The mixed stock should be sheeted rather thin and allowed to cool thoroughly before being stored. (5) The calender should be run at a fairly low temperature.

The tendency in current practice is undeniably toward low-temperature accelerators. They obviate the devulcanizing action of heat which lowers the tensile and shortens the life of stocks. They produce the best possible cured rubber, highly resilient and strong, and possessed of unrivaled aging properties.

FACTS AND FIGURES OF THE AUTOMOBILE INDUSTRY

In its 1924 edition of *Facts and Figures of the Automobile Industry* the National Automobile Chamber of Commerce publishes statistics which are of much value to the entire industry. There were produced last year 3,694,237 passenger cars, value $1,693,808,282, and 392,760 trucks, value $311,144,434. The world registration of motor vehicles was in excess of 18,000,000, the share of the United States being about 88 per cent. Exports from the United States, plus Canadian exports of American design, plus American cars assembled abroad, made a total for 1923 of 328,999 vehicles.

The amount of rubber used during 1923 in the manufacture of motor vehicles was estimated at 547,468,544 pounds, or 80 per cent of the total quantity of rubber produced. The federal government collected last year on parts, tires and accessories a total of $38,610,844, while automotive products as a whole paid during the year 77 per cent of the total special federal excise taxes. Last year was also a record one for automotive manufacture and sales, the motor vehicles produced in the United States reaching a total number of 4,086,997, a gain of 53 per cent over the year preceding.

ANNUAL MEETING OF A.S.T.M.

The Twenty-seventh Annual Meeting of the American Society for Testing Materials will be held from June 24 to 27 at Chalfonte-Haddon Hall, Atlantic City, New Jersey. An interesting program has been prepared, the various sessions comprising in general a symposium on corrosion-resistant, heat-resistant, and electrical-resistance alloys.

CUBA'S PURCHASE OF CANVAS RUBBER-SOLED SHOES FOR MARCH, 1924, was estimated at 117,769 pairs, valued at $81,508. During the same month England took 103,291 pairs, valued at $82,515, while the Philippines followed with 84,528 pairs, valued at $59,482.

Tire Factory Manufacturing Costs—III[1]

Production Reports Include Rubber Washing and Drying—Milling and Compounding—Calendering—Other Production Records—Tire Specifications

By Joseph J. Dawson

Production Reports

HAVING completed the survey of problems relating to the purchase of materials, and taken into consideration the reporting of time and its analysis, we now reach "Production Reports," upon the accuracy of which depend all efforts toward production control. Unless production records are dependable, costs will be distorted, inventories be incorrect, and the entire system doomed to failure.

Washing and Drying Rubber

Crude rubber is subject to varying percentages of loss, commonly known as shrinkage. Many shrinkage tables have been established by various rubber authorities, but experience has proven that they are unreliable as a basis for cost records. To properly control this condition it is necessary to use a "rubber preparation ticket." This ticket can serve two purposes,—as an order on the stores department for the delivery of rubber to the washing department, and as an order on the washing and drying departments for the performance of the work.

This ticket, issued in duplicate, should originate from the planning department, and show at its origin the quantity and kind of rubber required and the operation to be performed. Tickets should not be issued for greater quantities than the daily capacity of the drying facilities. It is better to issue a few extra tickets during the accounting period than to wait three or four days for their return. The ticket should first be sent to the stores department, where deliveries will be made as specified. This department should show on both copies of ticket the actual quantity delivered, sending the original with the rubber to the washing or drying department as the case may be, and the duplicate to the cost department for the follow-up file. The original should be kept with the rubber until after the washing and drying operations are completed. When the work specified is finished the resulting net weight delivered to the compound department should be shown on the original copy of the ticket, which is then forwarded to the cost department.

A complete record is thus obtained of the raw rubber used, being the basis for crediting the rubber account, and the rubber ready for use in compounds, which makes up the charge to the washed and dried rubber accounts. The shrinkage is automatically taken care of by using the value withdrawn from the raw account and the net weight chargeable to the finished account, which, with the labor and overhead necessary to perform the operation, gives the price at which the washed and dried rubber is to be charged to compounds.

RUBBER PREPARATION TICKET Nº 251

DATE_____

GROSS WEIGHT REQUIRED	DELIVERED FROM STOCK	NO.	OLD PRICE PER POUND	AMOUNT	NET WEIGHT DELIVERED TO COMPOUND	NEW PRICE PER POUND	REMARKS

PRICE AND AMOUNT ENT'D_____ ISSUED

NEW PRICE CALCULATED AND ENT'D MAY L. LED'G. CARD_____ FOREMAN

DEL'D FROM STR. BY_____ REC'D COMPOUND ROOM_____

Crude Rubber Preparation Form

Compounding and Milling

The compound formula is the control for all operations of the compounding and milling departments. This record should emanate from the development department, and should be issued in triplicate, one copy for the development department, one copy for the cost department, and one copy, preferably on card stock, for use in the compounding department as the batch formula. This card should show the quantity of each kind of material necessary to make up one batch of compound. Each batch of stock weighed out should be provided with a batch ticket containing two stubs. These tickets should be numbered consecutively, and all numbers should be accounted for. One stub of each batch ticket should be sent to the cost department from the compounding department daily as the record of batches weighed. The second stub remains with the batch until it is milled, and is then sent to the cost department as the record of milling production.

It will be readily seen that the compounding stubs of the batch tickets when tabulated, provide an accurate record of the number of batches and kind of compounds weighed out during any given period. This record, when used in conjunction with the cost department copy of the compound formula gives an accurate record for credit postings to the various material accounts and charges for material to compounds. In like manner a tabulation of the milling stubs of the batch tickets provides a cross check as to the amount of compound remaining unmilled at the end of each accounting period and the debit postings to the compound accounts.

Calendering

When the compound is run through the calenders it becomes gum stock, or when run in conjunction with fabric it becomes friction stock. The former is relatively simple as far as the compiling of production records is concerned, inasmuch as the shell and liner is all the tare to be deducted from the gross weight to calculate the net production. A calender requisition should be issued by the department requiring the gum stock showing the kind of stock required, the gage, width, and any other information neces-

[1] Continued from THE INDIA RUBBER WORLD, May 1, 1924, 503-505.

sary. This requisition serves two purposes, as an order on the calender department to deliver the material as specified and as an order on the calender crew to perform the labor necessary to prepare the stock.

As soon as the stock is run the calender crew should show on the requisition the shell and liner weights and the gross and net weights of the roll. This information must be verified by the inspector before any coupons are detached. The requisition should be punched on the back with the start and stop time of the calendering. The piece work coupon should be detached and initialed by the members of the calender crew and sent to the office at the end of each day with the day's time cards. The cost department coupon is the record of the calender production, and should be sent to the office daily, all numbers being accounted for.

In the case of friction stocks a new condition arises in the form of loss in weight of fabric caused by drying. This necessitates the recording of both the invoice, or purchased, weight of the fabric and the weight after drying in order to compensate for the loss. If the fabric inventory accounts are credited with the raw weight and value delivered to the driers, and the dry weight is used in conjunction with the rubber necessary to make the frictioned roll in determining the debit to friction stock, still retaining the raw value of the fabric, it will be readily seen that the loss due to shrinkage in drying is taken up in the new price for each roll.

Weights are recorded in exactly the same manner as explained for gum stock except for the fact that the weight of the fabric must be considered as tare with the shell and liner in calculating the amount of rubber used. New shell and liner weights must be shown for each skimming operation, as it is necessary to remove the original shell and liner in again passing the stock through the calenders. The inspector should verify all entries on the calender requisition. A piece-work ticket should either be attached to or accompany the calender requisition. This ticket should contain operation stubs to be detached and used as a supporting record for the daily piece-work cards for each operation.

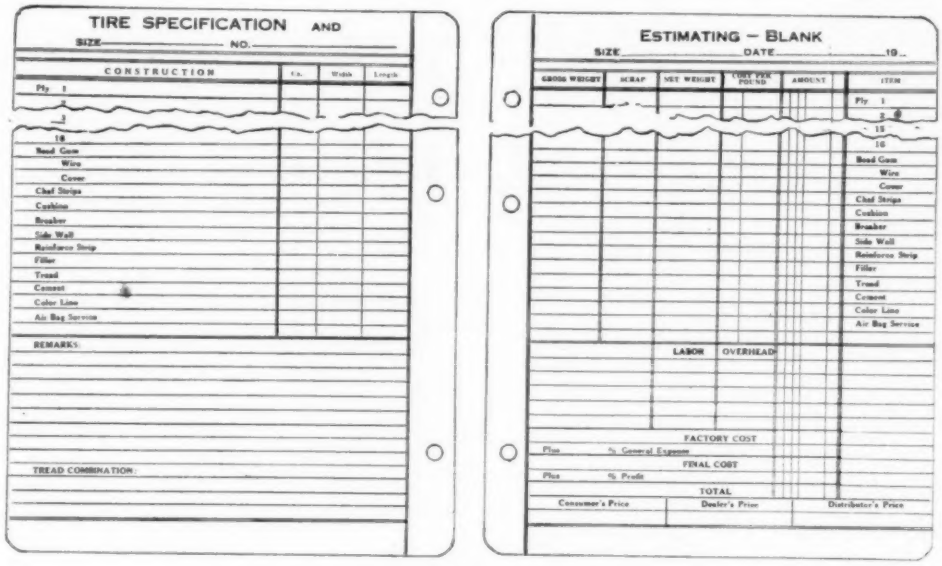
All production records should be posted to perpetual summaries or control sheets daily in order that the finished summaries may be ready for use as soon after the close of the accounting period as possible. Calculations may be made at the prices shown by the material ledger accounts as soon as totals are obtained. These figures are the basis for the journal entries crediting material accounts and debiting materials that are in process of manufacture.

Other Production Records

In order to follow out the process idea of costing it is necessary to obtain accurate information as to the exact number of units that have passed through each operation where a process cost is desired or may be necessary for inventory purposes. To obtain this result in tire manufacturing it is necessary to have the following information:

(1) Treads tubed or laid. (2) Beads made. (3) Beads cured. (4) Plies spliced. (5) Materials assembled for tires. (6) Tires built. (7) Tires cured. (8) Tires inspected and classified. (9) Air bags made. (10) Air bags cured. (11) Air bags worn out. (12) Flaps made. (13) Tubes rolled. (14) Tubes spliced. (15) Tubes boxed and classified.

A simple production report showing sizes and types may be used for this work. These should also be posted daily to perpetual summaries or control sheets. It is essential that the recapitulation of all production records keep pace with the manufacturing departments.



Specification and Estimate Forms for Tires

The Tire Ticket

The tire ticket is, perhaps, the most important production record in the entire cost line-up. It is through this ticket that practically all piece-work operations necessary to assemble and complete the tire, are controlled. It should be in tag form and contain detachable stubs, which, when properly filed, will give a complete history of the tire. The tire ticket should be supported by a tire record book showing all information necessary to follow the tire from the time the first ply is laid until it has either completed its service or been finally adjusted as mechanically defective.

To give a complete record the following stubs should be used and passed through the checking procedure as explained:

BUILDING—Should show date, size and type built and by whom built. After the inspector is satisfied with the workmanship, this stub should be punched with the designating punch provided for each inspector, detached and sent to the office as a supporting record for the piece-work data shown on the tire builders' time card.

RIMMING—Should show date, size and type, and rimmer's number, and should be detached at the time the air bag is placed in

the tire and the base rings are placed. These stubs should be sent to the office daily with the rimmers' time cards.

CURING—Should show date, size and type, also clock numbers of the layers, coverers and heater men in the crew by which the curing of the tire was handled. This stub should be detached and sent to the office daily as a supporting record for the time cards of the curing crews.

PRODUCTION—All information shown on the previous three stubs should also appear on the production stub. In addition the final inspector's record should be added. This stub should be detached at the time the tire is finally classified and sent to the office as a supporting record for the inspection report.

SHIPPING—Should show date, size and type, and shipping order number when shipment is made.

CUSTOMER—Should remain with the tire when shipped.

All stubs, after checking by the payroll department, should be sent to the statistical department for checking and incorporation with the permanent records on tire history.

The Tire Specification

The tire specification is the control for all credits to material accounts and charges to work in process. It is essential that all specifications be accurate and that the cost department be immediately notified of changes in construction in order that all specification data may be corrected. This data when properly compiled is invaluable in estimating costs to meet sudden market fluctuations or merchandising difficulties as well as being a component part of the cost system.

In order to properly establish a specification it is necessary to make a series of observations and records for each size and type manufactured. Actual gages, widths and lengths of stock used must be taken into consideration and all data given, which will aid the cost department to either arrive at an average or establish a standard which can be depended upon to be correct. Where possible, it is a very good practice to disregard unit records and establish material data per hundred tires. This method reduces the possibility of error to a minimum.

When changes or new constructions are authorized the cost department should be immediately notified as to what change is to be made and the exact time the change is to be put into effect. This will enable them to provide in their set-up for any variations the change might cause. Any change in the specification, no matter how trivial, if not immediately corrected may cause thousands of dollars of lost profits in the course of a year. The manufacturer who gives his cost organization the greatest cooperation is the manufacturer who has the greatest feeling of security. Even though his statements show that his profits are not what they should be, he at least knows that they are correct.

The Rubber Exhibit at the Smithsonian Institution

RUBBER production and manufacture has at last taken its rightful place among the great American industries shown by educational exhibits in the Smithsonian Institution at Washington, D. C. The outline of the exhibit issued by The Rubber Association of America, Inc., under whose auspices it has been gathered, indicates its comprehensive character, its informative value to the public and inspiration to the trade.

The exhibit comprises the following sixteen sections, ten of which are devoted to rubber products and uses of rubber.

OUTLINE OF THE RUBBER EXHIBIT

1. Natural History of Rubber Production
2. Commercial Paw Rubber
3. Rubber Manufacture, General Operations
4. Aid of Rubber in the Communication of Ideas
5. Rubber as an Aid to Transportation
6. Rubber in Control and Transmission of Power and Light
7. Mechanical Rubber Goods
8. Fighting Fire with Rubber
9. Waterproof Footwear and Clothing
10. Rubber in the Service of Health
11. Rubber in the Home
12. Toys and Sports
13. Rubber in Warfare
14. Reclamation of Rubber
15. Rubber Substitutes and Related Materials
16. History of Rubber

The natural history of rubber is presented by a series of photographs of rubber plantations in the East, showing stand of *Hevea brasiliensis*, methods of tapping, gathering and coagulating latex, smoking sheets, crêpe machines, etc.; photographs of South American collection of wild rubber, smoking and drying latex, types of producing trees. There are specimens of tapping tools, latex cups, jars of latex, rubber seeds, palm nuts for smoking Pará, chemicals for coagulating and smoking plantation rubber.

Large samples show the chief types and grades of plantation rubber, and how they are packed and shipped. There are also samples of the chief types of wild rubber, such as Upriver fine, Upriver coarse, Caucho ball, Centrals, Congo, Rambong, Guayule. Photographs depict methods of marketing, shipping, storage, etc., while graphic statistics bring out the relative importance of plantation and wild rubber, the production and the consumption of raw rubber by countries.

The general operations of rubber manufacture are well illustrated by photographs of the main processes, such as opening bales, tearing apart sheets, rotary knife and band saw slicing, cracker, washer, driers, compounding room, weighing out mixtures, rubber mixers or mills. The specimens displayed include sheets of washed rubber and other ingredients ready for the mixer, examples of mixing ingredients with reasons for using (sulphur, carbon black, zinc oxide, etc.), rolls, sheets and mixed batches ready for aging. Specimens of crude rubber and sulphur show the relative proportions needed to make hard rubber or ebonite.

The ten sections numbered 4 to 13 inclusive are devoted to rubber products and uses of rubber for many varied purposes and indicate conclusively the indispensability of rubber in modern life.

The section devoted to the reclaiming of rubber comprises samples of rubber waste used for reclaiming. There are specimens of rubber reclaimed by the acid and also by the alkali process, and others showing various stages of reclamation by both processes. Photographs show the main steps in each process.

There is a large collection of such rubber related materials as gutta percha, balata, jelutong, chicle, oxidized oils, guayule, etc., with examples of the uses of each. Photographs illustrate the trees yielding these products and methods of collecting and curing.

The history of rubber is well told by an adequately varied collection of articles of native manufacture, showing primitive uses; old manufactured articles, showing obsolete shapes, styles and methods of vulcanization; personal relics of men famous in the rubber industry, particularly Goodyear relics. The photographic exhibit includes portraits of pioneers in rubber utilization and invention, illustrations of old factories, machines, tools, etc.

This exhibit is the result of months of work in assembling samples and securing photographs on the part of The Rubber Association committee that had it in charge. Nor should it be forgotten that the suggestion for its installation in Washington came from the *India Rubber Review* of Akron, who more than a year ago brought it very clearly and forcibly before the leaders in the trade.

The Manufacture of Automobile Tire Rims[1]

A Model Factory—Making a Clincher Rim—Electric Welding—Double Inspection—Automatic Galvanzing—Final Inspection

AKRON today is the seat of one of the world's largest rim factories. Numerous improvements in rim construction and building methods, as carried on in this plant have practically revolutionized rim manufacture. The fundamental object was to build and equip a factory, specialized in rim production—a plant where the present standard types and sizes of rims could be produced in volume and on an economical basis.

With a daily capacity of 4,800 steel solid tire bases and 65,200 pneumatic tire rims, steel felloes, felloe bands and rings, this plant is the principal source of supply for two important industries. Incidentally more than half the automobile and practically all truck makers use rims made in this plant as standard original equipment.

A Model Factory

In the new factory all operations are performed on one floor, under the same roof. Straight-line production was provided so that raw material could be unloaded at one end of the factory, put through various operations, and shipped at the other end. This plan eliminates much handling, saves time and cuts inventories of materials and finished products.

Finished Rims and Solid Tire Bases

Production starts at one end. Switching tracks bring the freight cars loaded with steel into the building, where it is unloaded in the proper section. There is sufficient space on these tracks to permit the unloading of ten cars at the same time. The steel is lifted from the cars by a giant transverse crane and placed on the inspection platform in the proper section or bay. From here it is stored and fed into production as needed by cranes in each bay.

Making a Clincher Rim

Although the order of operations differ more or less in the various types, the 3½-inch clincher rim may be taken as typical at least of the efficient methods employed throughout the factory.

This is an entirely new mechanical development in rim manufacture. Its automatic operations enable one man to perform three complete processes, formerly requiring five men. The economy and far greater accuracy permitted by this machine is naturally reflected in the quality of the finished rim.

Automatic, Electric Welding

After circling, the rim is placed in an automatic electric welding machine. The operator presses a foot lever, concentrating on the splice a heat which gradually increases to a temperature of about 2,600 degrees F. When a sudden heavy pressure is automatically exerted, the current is cut off and the weld completed. This automatic feature assures absolute uniformity in every weld. It replaces the old hand process, thus eliminating the human element from this important operation. It further prevents the waste resulting from "burned" steel, a not uncommon occurrence under the old method where the welding period was left entirely to the judgment and skill of the operator.

In the welding operation the ends of red hot steel are pressed so tightly together as to flatten out somewhat, causing a lump of metal at the joint. This is known as the "flash," which is then trimmed off, leaving a smooth, clean surface. The trimming is done in another special machine, which produces a better job in a shorter time and with less handling than by any other method known.

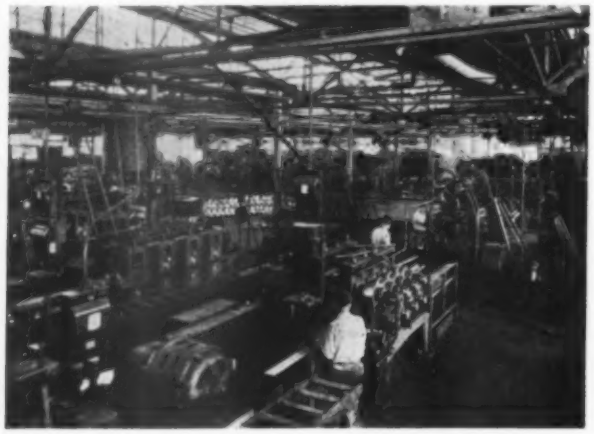
Plant of the Firestone Steel Products Co., Akron, Ohio

[1] Data and illustrations from The Firestone Steel Products Co., Akron, Ohio.

The Forged Weld

Every weld is forged in a specially constructed electric hammering machine. This straightens the fibers in the steel and results in an inseparable union. This forging method has been so perfected that it costs no more to employ than less effective methods as grinding or pressing, commonly used in rim manufacture.

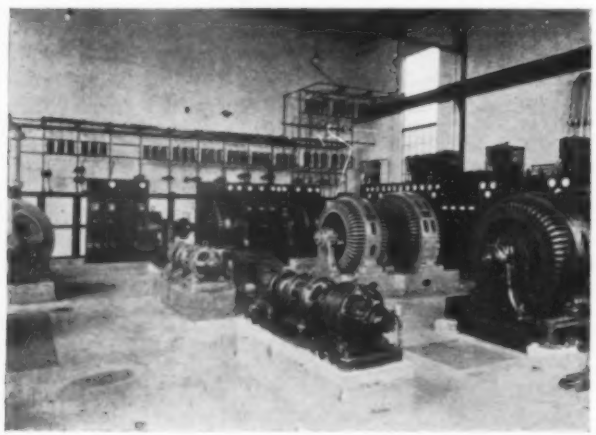
After the welding is completed, the rim is ready for cold rolling,



A Corner of the Factory

in which the channel is shaped and the ends are curled over to form the flanges. The rim is next expanded to secure a perfectly true circle and an accurate inside measurement. This operation also places a severe test on the weld, insuring against cracks and breaks in use. The outside measurement is next trued up by compressing the rim which then goes to a press where the valve hole is punched and upset.

A seamless tube is next riveted in the valve hole, which is a refinement that serves as a protection to the tire valve stem and acts as a driver for the rim. The edge of the flange is then rolled in order to make a smooth rounded contact for the clincher bead



The Power Plant

of the tire. Great care is exercised to obtain perfect results, as any flaw in this process results in rim cuts. The rim is then ready for inspection.

Double Inspection System

In addition to the thorough inspection given each rim after the various operations, a complete inspection is given at this stage by representatives of the Tire and Rim Association. This further check eliminates the possibility of defects in material and workmanship. Being complete, the rim is stamped with the maker's name, the size, and the Association approval, and is then ready for galvanizing.

Automatic Galvanizing

An automatic galvanizing unit mechanically dips the rim in the various solutions for the proper length of time. The first dip is boiling caustic soda which cuts away the oil, grease and foreign matter. Following this it goes into a tank of boiling sulphuric acid which removes scale and any remaining grease. An interesting feature of the sulphuric acid dip is a series of suction fans which remove the acid fumes. A shower bath of water washes off the acid to prevent contaminating the solution into which the rim is next dipped. This is known as "cyanide strike," by which the pores in the surface of the steel are electrically opened up to remove the last possibility of chemical and physical impurities.

Next comes the galvanizing tank. The conveyors which have taken the rim through each solution also carry it through the galvanizing liquid. A novel device forces the rim to turn over completely three times during this operation to insure equal plating. After a thorough washing in water under pressure, the rim is finally inspected for quality of plate. Gravity lines then take it to a freight car ready for shipment. A device placed on each line automatically counts the rims as they roll by.

Excellent Working Conditions

Throughout this great plant detailed attention has been directed toward working conditions. The factory and laboratories as well as the office are lighted, heated and ventilated by the most up-to-date methods and devices. Ideal working conditions—comfort, both summer and winter—give every encouragement to quality and volume of work.

The automotive requirements of the future have been the foundation of the production schedule, and the manufacturing program is not only equal to the immediate needs of the industry but designed for future expansion.

MANUFACTURERS OF BALLOON TIRES

Balloon and balloon type tires are now being produced in this country by about fifty tire manufacturers, some of the typical tire sizes being listed below:

FIRESTONE TIRE & RUBBER CO., AKRON, OHIO. For small diameter rims: 4.40, 5.25, 6.20 and 7.30.

FISK TIRE CO., CHICOPEE FALLS, MASSACHUSETTS. For small diameter rims: 28 by 4.40, 29 by 4.40, 29 by 4.95, 30 by 4.95, 30 by 5.25, 31 by 5.25, 30 by 5.77, 32 by 6.20, 33 by 6.20, 34 by 7.30, and 36 by 8.40. Replacement: 31 by 4.40, clincher, 31 by 4.40, 32 by 4.95, 33 by 4.95, 33 by 5.77, 34 by 5.77, 35 by 5.77, and 35 by 6.60.

GENERAL TIRE & RUBBER CO., AKRON, OHIO. For small diameter rims: 4.40, 5.25, 6.20 and 7.30. For replacement: 31 by 3.85, 32 by 4.95, 33 by 4.95, 33 by 5.77 and 34 by 5.77.

HEWITT RUBBER CO., BUFFALO, NEW YORK. For small diameter rims: 4.40, 5.25, 6.20 and 7.30. Replacement: 31 by 4.40, 32 by 4.95, 33 by 4.95, 34 by 4.95, 33 by 5.77, 34 by 5.77 and 35 by 6.60.

MURRAY RUBBER CO., TRENTON, NEW JERSEY. For small diameter wheels: 4.40/21, 5.25/20, 5.25/21, 6.20/20, 6.20/21, and 7.30/20. For present rims: 31 by 4.40, 32 by 4.95, 33 by 4.95, 33 by 5.77 and 34 by 5.77.

PENNSYLVANIA RUBBER CO., JEANNETTE, PENNSYLVANIA. For small diameter rims: 28 by 4.40, 29 by 4.40, 31 by 5.25, 32 by 6.20, 33 by 6.20, and 34 by 7.30. Replacement: 31 by 4.40, 32 by 4.95, 33 by 4.95, 34 by 4.95, 33 by 5.77, 34 by 5.77, 35 by 5.77, and 35 by 6.60.

UNITED STATES TIRE CO., 1790 BROADWAY, N. Y. For small diameter rims: 29 by 4.40, 31 by 4.95, 31 by 5.25, 32 by 5.77, 32 by 6.20, 33 by 6.20, 34 by 7.30, and 32 by 5.25. Replacement: 31 by 4.40, 32 by 4.95, 33 by 4.95, 34 by 4.95, 33 by 5.77, 34 by 5.77, 35 by 5.77, and 35 by 6.60.

Rubber Machinery or Hand Labor?

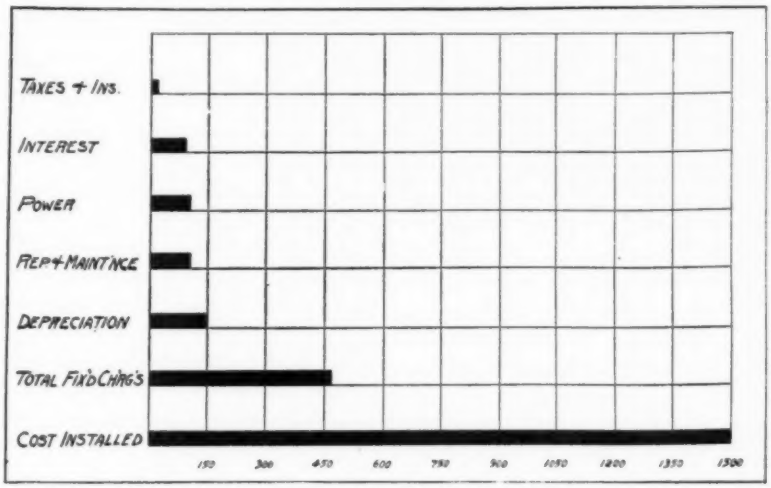
Machinery an Investment in Labor—First Cost and Maintenance—Yearly Savings

By Rhodes Polleys

IN THIS mechanical age there are many times when a factory executive has to pass on the advisability of purchasing a new machine or mechanical device to replace hand labor in his plant. It is the purpose of this article to give a brief outline by which such a decision can be wisely made.

An Investment in Labor

When a machine is purchased it should represent to the purchaser an investment in labor even though it be performed mechanically. Our grandfathers had very little machine labor to worry about and their chief concern was to make certain that a full measure of hand labor was being returned for each wage dollar expended. Machinery should be viewed in the same light, and unless it is certain that full value is to be returned, the purchase of new equipment should not be sanctioned. Generally speaking, if a fair return is not realized on the investment, the buyer has failed to consider the simple rules which justify or condemn the purchase of machinery.



Analysis of Yearly Machine Cost in Dollars

A Machine Should Pay for Itself

First of all, before purchasing a machine, the executive should have reasonable assurance that the operation for which the machine is being considered is to be performed for a sufficient period and in enough volume so that the machine will have time to pay for itself before lack of orders or a change in style make it inactive. Many a machine bought at heavy expense has performed its work faithfully only to fail as a dividend payer because the buyer lacked foresight or else overlooked the point of having sufficient work in sight to keep the machine operating for a prolonged period.

This point is particularly important in the rubber footwear industry where frequent changes in styles of women's shoes make it very difficult for even the wisest of the wise to prophesy how long a certain shoemaking operation has come to stay. A good rule for such cases would be to confine the excessive machine expenditures to the basic or nonvariable operations such as are performed in the mill room, cementing department, packing room, etc. Trouble will result if snap judgment is used when considering machinery or new devices for the cutting or making rooms, as changes in shoe construction are most costly in these departments.

Cost of a Machine and Its Maintenance

The next point to be considered is the cost of the machine to the purchaser. It is needless to say that it pays to shop around in order to obtain a good machine at the right price. Also, don't forget that the installation cost must be included in the figures. This point is frequently overlooked in the small plant where adequate planning is not available.

Before buying an automobile one must be certain that he can afford to supply it with gasoline and tires and keep it in operating condition. Similarly, it must be understood that the purchase price of a machine is only the first cost, as it must be supplied with power and maintained in service. A rough analysis of these maintenance or fixed charges is shown in the table below.

Taking each of the various items separately, a short explanation will be given to show what each one includes.

Interest

It must always be figured that idle money can be put to work and earn a fair return, usually at the rate of 6 per cent when carefully invested. Therefore if money is invested in a machine this interest is lost, and it should be returned out of the machine's earnings. It costs, then, 6 per cent to tie up capital in the machine investment.

Depreciation

Everything depreciates, and machinery is no exception. In order to offset this depreciation a certain amount is set aside each year to replace the machine when worn out. There are many complicated ways of writing off this machine depreciation, depending on the type of machine and the use for which it is intended. For general purposes of hasty calculation it will suffice to assume that an even amount is to be deducted each year from the total cost of the machine as installed up to the time that the original cost has been written off of the books. For example, assume that the machine has a useful life of ten years and that it has cost us $1,500 installed. In this case $150 is the annual amount to be set aside for replacement at the end of the ten-year period.

FIRST COST OF MACHINE	
Purchase price	$1,250
Installation cost	250
Total cost installed	$1,500
MAINTENANCE CHARGES	
Interest on investment at 6% per year	$90
Depreciation at 10% on ten-year life	150
Power cost at $100 per h.p. per year	100
Taxes and insurance at 1%	15
Repairs and maintenance	100
Yearly fixed charges	$455

Power

Power costs depend on the type of power the machine requires. Steam, electricity, or other sources may be called for, but a con-

servative estimate can be made at $100 per h.p. per year. Thus, if the machine we are purchasing calls for a one horsepower motor $100 per year must be set aside to meet this expense. This figure is high for most cases.

Taxes and Insurance

These two items can be considered under one head and a safe figure for this can be taken at 1 per cent of the installed cost.

Repairs and Maintenance

This last item is the hardest of all to estimate, as it is affected by many variables, such as poor supervision, unskilled labor, flaws in workmanship, etc. Usually an estimate of this can be obtained from the machine manufacturer or else figures are available for similar machines in the plant. In the machine being used as an example, we will assume that it takes $100 per year to keep it in repair. The type of machine and the use to which it is put might raise or lower this figure, and it can not be used in any specific case. It is also true that a machine wears out more rapidly as it ages, but in cases where only general figures are wanted it is assumed that the wear and tear on the machine is an even amount each year.

Calculation of Machine and Hand Labor Costs

The total machine cost figures having been obtained from the above fixed charge total, we must add the yearly labor cost which will be necessary to operate the machine, thus:

Fixed charges + total daily wage to operate machine × 270 days = total yearly machine expense. Suppose this to equal $1,600.

The next step is to compare this total machine cost per year with the cost of performing the same operation by the hand method. This hand method cost must first be obtained, and this can be done by taking the total daily wage cost for a hand production equal to the daily output of the proposed machine and multiplying it by 270 working days. This can be expressed as follows:

$$\frac{\text{Daily wage per man}}{\text{One man's daily production}} \times \text{daily production of machine} \times 270 \text{ working days} = \text{cost of hand labor for a production equal to machine production per year.}$$

Suppose this to be $2,000.

Net Yearly Savings

Subtracting the two costs, we can obtain the balance which tells the story.

Hand cost	$2,000
Machine cost plus labor	1,600
Net yearly saving	$ 400

Taking the above savings of $400 per year and knowing that the machine has cost $1,500 to install new, it can easily be determined how soon the machine will pay for itself. In the example just given, it can be seen that the machine will pay all fixed charges and in addition pay for itself in approximately three and one-half years. The following years will show a clear profit for the machine of $400 annually.

The cost of materials put through the machine or used in the hand operation has not been considered in this article as both are considered to be equal. There are times, however, when considerable scrap can be salvaged by machine installation. This saving, if an appreciable amount, can be added to the net yearly savings shown above. The machine will also have a scrap value at the end of its ten-year period, which has not been considered.

IN THE STRAITS SETTLEMENTS A FAIRLY GOOD GRADE OF INSULATING tape is extensively used, the manufacturer being the local Chinese firm of Tan Kah Kee. In the production of this tape pure latex is used, with the result that the Chinese line of goods is often preferred to the imported article, which comes mainly from Great Britain. A full line of rubber tubing is also manufactured by the Tan Kah Kee organization.

Critical Temperatures of Popular Accelerators

Nitrogenous organic compounds capable of accelerating the vulcanization of rubber comprise a long list of which comparatively few possess commercial and technical value in rubber manufacturing. The popular accelerators in current American rubber practice number ten or a dozen, of which aniline was the first generally employed as an accelerator. It occupied the field alone for a few years until thiocarbanilide, "thio" for short, was introduced and became its close rival. Both materials continue in the list of popular accelerators, holding their places because of low cost and other practical considerations which, in large degree, offset the special drawbacks of each.

The list below is limited to commonly used accelerators arranged in order of activity as influenced by their critical temperatures, meaning the lowest heat by which they will exert their maximum accelerating properties to produce a commercial cure in unit time. The temperatures are expressed in degrees F. and corresponding steam gage pressures. They apply particularly to mold press heats but will serve as a guide in hot cures generally.

CRITICAL TEMPERATURES OF COMMON ACCELERATORS

Accelerator	Steam gage pressure	Temperature degrees Fahrenheit
Super sulphur No. 1[1]	10	239
Tuads[2]	20	259
A 7 and A 19[3]	30	274
Ethylidine aniline	30	274
Super sulphur No. 2[4]	30	274
Diphenyl guanidine	40	287
Heramethylene tiramine	50	297
Formaniline	50	297
Aldehyde ammonia	50	297
Aniline	50	297
Thiocarbanilide	50	297

[1]Oxidized zinc salt of dimethyl-dithio-carbamic acid.
[2]Tetra-methyl-thiuram disulphide.
[3]Acetaldehyde derivatives.
[4]Oxidized lead salt of dimethyl-dithio-carbamic acid.

It should be noted that the relative activity of accelerators is dependent on many factors. The classification of accelerators in the above table is based on experience with these substances. One must realize that regardless of time and temperature it is impossible to duplicate the physical properties of a stock cured by one accelerator in that cured by another. For example, the physical characteristics in a stock when cured with thio are distinct from those it has when cured with hexa, although these accelerators are noted in the table as having the same critical temperature. For this reason the compounding department of rubber factories can advantageously stock a number of accelerators of demonstrated practical value.

Selection of accelerators in compounding should be made with respect to the method and degree of cure desired and to correlation of the stocks used when these are planned to cure in a combination make-up of goods, also with regard to the physical characteristics intended in the products. The use of ultra accelerators and low temperature cures is increasing because their superior technical and economic values are important competitive factors.

PREVENTION OF BENZOL POISONING

The National Safety Council, through its divisions devoted to rubber and chemicals, has for some time been investigating the hazards of benzol in American industries, and a special committee has been formed, headed by Professor C. E. A. Winslow of the Yale Medical School, New Haven, Connecticut.

This committee is now putting into the field a physician and an engineer in order to study factory conditions and to devise means for preventing benzol poisoning. Rubber manufacturers using benzol to any considerable extent are urged to communicate with Professor Winslow regarding cases among their employes of supposed benzol poisoning, such cases to be treated by the Safety Council entirely without expense to the manufacturer.

Cooling Water for Tire Vulcanizers

Novel Application of Heating and Ventilation System. Cold Water for Cooling Tire Vulcanizers

FEW, if any tire manufacturing plants have, at all seasons, a sufficiently ample supply of water available at sufficiently low cost to permit its unlimited use for cooling the vulcanizers and molds and allow it to run to waste.

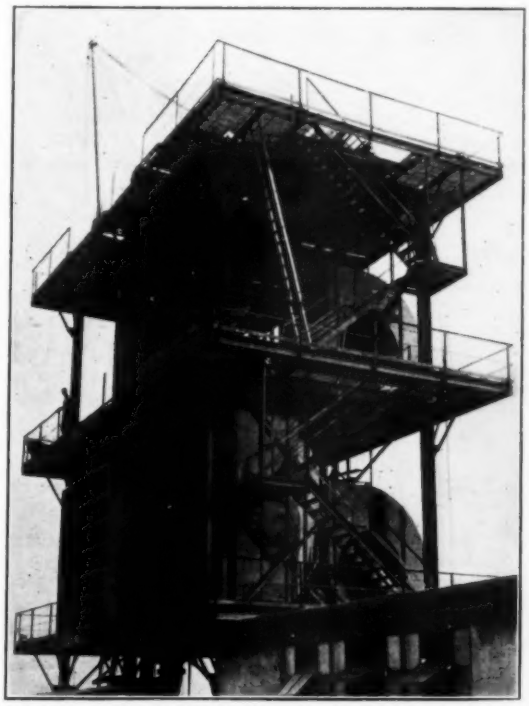
The average tire vulcanizer requires about 150 gallons of water for cooling each heat of tires in the molds. Where many vulcanizers are continuously operated in short heats the water required for mold cooling totals a large volume daily and the need is urgent to recirculate it and reduce its temperature for repeated use by an efficient cooling system.

Seasonal shortages in the supply of water for tire mold curing, considerations of economy and more efficient use of the supply available have led one of the leading rubber companies of America to install at its Akron plant a special water cooling system unique of its kind.

Carrier Water Spray Coolers

The illustrations show the installation of the carrier system of ventilation by which air is circulated through chambers containing water sprays. The cooled water after spraying is recirculated to the vulcanizers for reducing the temperature of the molds. In this manner the water supply is consumed by repeated use and increased cooling effect. The apparatus employed consists of six air washers of the carrier type and six No. 14 double duplex conoidal fans for circulating the air, the washing of which reduces the temperature of the circulating sprayed water.

This apparatus is assembled in the form of a tower about 60 feet high on the roof of the vulcanizer building, of which a general view is given in Figure 2. Each pair of fans and washers is placed in parallel, as seen in Figure 1, which represents the cooling plant tower under erection showing air washers, air ducts leading to them, and the galleries and stairways which give access to the various units of the apparatus. The fans are fully housed and provided with top horizontal discharge. Three of the fans are right-handed and three are left. The washers will handle 167,000 cubic feet of air per minute at 690 feet per minute velocity. The hot water from the vulcanizers comes to the spray nozzles at 20 pounds pressure and at a temperature ranging from 160 to 90 degrees F. Hot water at the rate of 4,500 gallons per minute is cooled to a per cent of difference between the entering hot water temperature and the outside wet bulb temperature. The nozzles in the washers are arranged to spray in opposite direction to the flow of air, while the baffling plates are placed at the inlets of the washers.

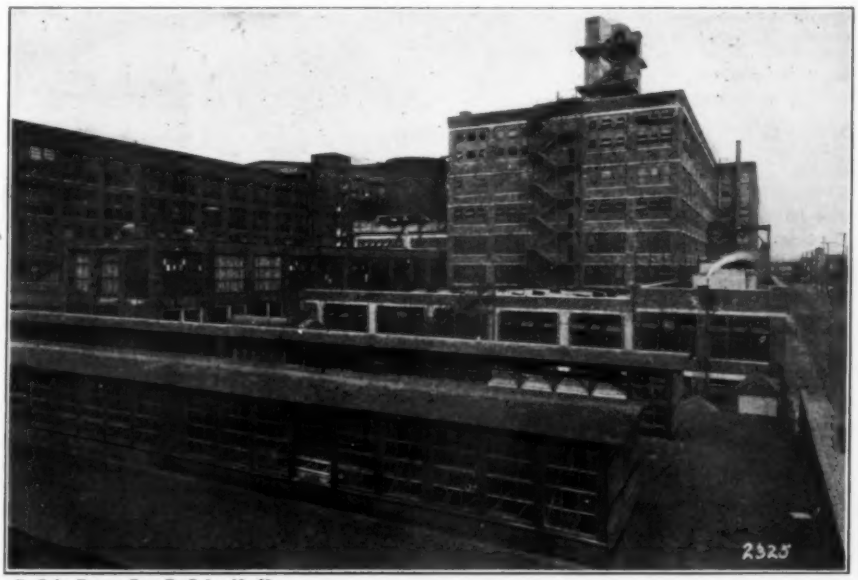


Buffalo Forge Co., Buffalo, N. Y.

Fig. 1. Details of Carrier Water Cooling Tower

Advantages

Some of the advantages secured by this system of cooling by air washing should be noted. They are: (1) Cooling is quickly effected and the rapidity of operation increases the capacity for cooling each vulcanizer unit. (2) Erection of the apparatus on the roof makes its space requirements of no concern to the factory management. (3) Its simplicity of operation and its automatic character commend its use from an engineering standpoint. (4) Towers installed on the roof give the advantage of the use of gravity for the return flow of the cooled water. Most im-



Buffalo Forge Co., Buffalo, N. Y.

Fig. 2. Water Cooling System on Roof of The B. F. Goodrich Co.'s Plant, Akron, Ohio

portant of all is the fact that with this type of cooling there is absolutely no loss of wind blown water or drift of the spray. These spray coolers are equipped with water eliminators which effectively remove all entrained water from the air.

The successful application of this heating and ventilating system into the field of water cooling for manufacturing purposes indicates economic possibilities of great interest and value.

FOREIGN RUBBER TRADE INFORMATION

A series of special circulars, containing brief items of interest regarding the rubber industry in various foreign countries, is now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C. As a rule each of these publications contains a number of items, although some are devoted to a more detailed account of the rubber industry in some one country. Those of the latter class mentioned below are marked with an asterisk.

Number	Special Circular
413	"Canvas Footwear Market in Wurtemberg and Baden, Germany," etc., etc.
414	"Tire Market of San Salvador, Salvador," etc., etc.
417	"Tire Market of Belize, British Honduras," etc., etc.
421	"Canvas Rubber-Soled Shoes in Nicaragua," etc., etc.
422	"Tire Market in Corinto, Nicaragua," etc., etc.
*423	"Michelin Institutes Mail Order Merchandising Policy in Norway."
427	"Conditions in British Asbestos and Mechanical Rubber Goods Trade," etc., etc.
*428	"Retail Tire Prices in Argentina."
430	"Tire Price Changes in Argentina Encouraging," etc., etc.
433	"Tire Market in Habana, Cuba," etc., etc.
436	"Rubber-Soled Shoes in French Indo-China," etc., etc.
*438	"Market for Canvas Rubber-Soled Footwear in Chile."
*442	"Market for Canvas Rubber-Soled Footwear in Australia and New Zealand."
*446	"Tire Price Increases in Scandinavia."
*448	"Tire Price Increases in Brazil and Chile."
449	"Tire Market of Bahia, Brazil," etc., etc.
450	"Trend of Mechanical Rubber Goods Trade," etc., etc.
451	"Rubber Footwear Market in Rumania," etc., etc.
*452	"Retail Price Increase in Dutch East Indies."
*453	"Retail Tire Prices in the United Kingdom."
454	"Automobile Registration of Nuevitas, Cuba," etc., etc.
*457	"Retail Tire Prices in Brazil."
*458	"Sixth International Rubber Exhibition."
460	"Tire Market in Antilla, Cuba," etc., etc.
*461	"Retail Tire Prices in Argentina."
462	"Pure Plantation Rubber for Footwear Soles," etc., etc.
*463	"Market for Canvas Rubber-Soled Footwear in India."
465	"Export Trade Notes on Mechanical Rubber Goods," etc., etc.
468	"Tire Market in Santo Domingo," etc., etc.
*469	"Exhibit of Rubber Association of America at Brussels Rubber Exhibition."
*470	"Non-American Rubber Goods at Brussels Rubber Exhibition."
*471	"Retail Tire Prices in Sweden."
*472	"Retail Tire Prices in Portugal and Switzerland."
*473	"Hongkong Trade in Raincoats."
474	"Market for Rubber Footwear in Lithuania," etc., etc.
477	"Tire Market in Tampico, Mexico," etc., etc.
*478	"Market for Automobile Tire Covers in Great Britain."
Trade Information Bulletin—	
218	"Export Trade in Rubber Footwear.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(399) We are asked for names of manufacturers of soft rubber cushions for telephone receivers.

(400) Prospective purchaser desires names of manufacturers who could supply hard rubber cigarette holders in quantity.

(401) Inquiry is made for addresses of manufacturers of a machine for stencilling rubber mats.

(402) A list of manufacturers who rubberize stockinette is requested.

(403) From Budapest, Hungary, comes a request for a source of supply of hollow needles used for inflating rubber balls.

(404) A subscriber requests a list of manufacturers of transparent nipples, pacifiers, rubber gloves, etc., in the United States, Germany, or elsewhere.

(405) We are asked for a source of supply of tire building materials.

(406) Address of a manufacturer of transparent rubber is requested.

(407) Information is requested in regard to a machine for putting washers on the pins in rubber heel molds.

(408) A subscriber asks whether or not there are on the market composition molds other than steel, etc., for hard rubber goods, as well as elastic.

(409) We are asked where ammonium carbonate in powdered form for use in rubber compounding may be obtained.

(410) A manufacturer of novelties wishes to get in touch with manufacturers of rubber sheeting with calico base in variety of colors and designs; also sheeting with a base of calico and face of colored rubber in plain colors and designs.

(411) We are asked to supply a list of manufacturers of rubber tea aprons, ruffled.

(412) A doctor asks where he can get pure rubber stockings and socks.

(413) Names of firms handling gilsonite are requested.

(414) We are asked for names of firms supplying gutta percha tissue.

(415) Inquiry is made for source of supply of rubber tubing with fused ends.

(416) We are asked for the name of a large reliable manufacturer and importer of olive oil.

(417) Request is made for books on proofing.

(418) From Buenos Aires comes a request for names of manufacturers of druggists' sundries who might desire representation in Argentina.

(419) We are asked for the address of the manufacturer of Santro nipples.

(420) Information is desired as to where "Shensi," an accelerator, may be obtained.

Foreign Trade Opportunities

Addresses and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Requests for each address should be on a separate sheet and state number.

Number	Country and Commodity	Purchase or Agency
9,975	South Africa—Rubber soles and heels and rubber specialties	Purchase
9,996	Poland—Tires and tubes	Purchase and agency
10,015	China—Boots and shoes and tires	Agency
10,024	Austria—Garters	Agency
10,048	Brazil—Vulcanizing machine, with table, capacity for handling 3 tires at a time	Purchase
10,075	Turkey—Galoshes	Purchase or agency
10,076	South Africa—Rubber sundries and specialties	Agency
10,077	Sweden—Rubber tubing with flexible metal core	Purchase
10,106	Austria—Rubber shoes and snow boots	Purchase
10,195	Lithuania—Rubber shoes with warm felt linings	Agency
10,196	Switzerland—Druggists' and surgical rubber goods	Purchase and agency
10,197	Austria—Clincher tires for automobiles and trucks	Agency
10,216	Poland—Automobile tires	Purchase
10,224	Germany—Golf balls	Agency
10,225	Sweden—Surgeons' gloves	Agency
10,226	France—Footwear, including overshoes, sneakers, bathing shoes, tennis shoes, and boots; bathing caps; rubber goods for industrial use, such as hose, belting, packings, washers and joints	Agency
10,227	Austria—Surgical rubber goods	Purchase
10,228	Austria—Snow and overshoes	Agency
10,234	India—Canvas hose; white rubber packing, and rings	Agency

Trade List Available

Number	Country and Commodity	
BE-1005-B (Revision)	Newfoundland — Rubber goods	Importers and Dealers

Branding, Printing and Ornamenting Rubber Goods

Metal Branding Plates—Engraved Molds—Plastic Ornamentation—Printed Paper Transfers—Ornamenting Hollow Goods—Marbleized Effects—Decorating Play Balls—Decalcomanie Transfers—Clothing Labels

THE great variety in rubber goods and their modes of construction requires varied means for branding, labeling and printing upon them. Some of the methods employed are described below as applied to well known types of rubber products.

Metal Branding Plates

On wrapped goods such as hose of all kinds, wrapped automobile tires, pressed, cured and molded articles, branding in raised lettering is the usual rule. This is accomplished by the use of thin sheet metal embossed labels usually of aluminum. These are applied to the uncured rubber goods and are fixed in place by pressure, either by the wrapping, in the case of open cured goods such as hose, or by pressure in the mold or curing plates in a press. Such metal labels may be produced in several ways, as by using a steel stamp and hand hammer, a cut die and counter, or in some form of press.

The hand power press, shown herewith is used for making single line labels from aluminum strip stock. Larger labels are embossed under a bench drop hammer on a steel die. Because of their length calender labels for railway air brake, signal and car heating hose require a power press of the inclinable type.

If the brand is not to be colored the embossed metal label is impressed on the article direct. If a colored brand is desired thin sheet colored rubber is attached to the back of the metal label either by cement or pressure.

Rover's Hand Embossing Machine

After curing, the metal label is stripped off and the brand shows in colored rubber. Metal labels have the advantage of being repeatedly usable and possess a salvage value which partly offsets their first cost.

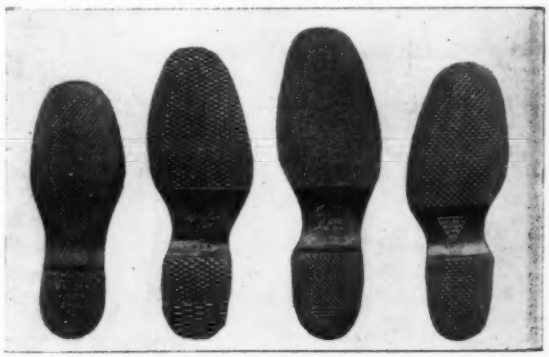
The all-over branding of press cured sheet rubber packing is done by stamping with hammer and hand tool a branding sheet of aluminum with suitable lettering. This is then used as a cover for the packing in the curing press with its lettered surface next the rubber, effecting permanent branding in the cheapest possible way.

Labels Engraved in Molds

Molded articles produced in large quantities, as heels, tires, etc., are always branded and given other surface markings, such as anti-skid designs, by engraving or die sinking direct on the mold surfaces. This insures uniformly neat work and the expense and trouble incident to branding labels are eliminated.

Plastic Ornamentation

Branding is easily made ornamental as well as useful as identification. In this feature the plastic property of rubber is an aid,



Sole and Heel Embossing

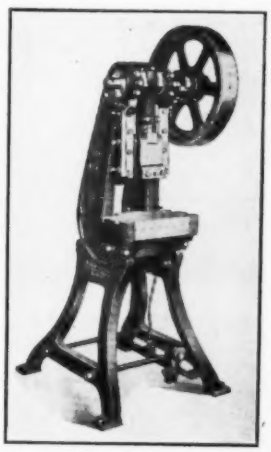
permitting an endless variety of form and design by the usual embossing and molding methods, as seen on soling, heels, tires, etc. Effects of this sort are usually secured by die sinking, or engraving molds or calender rolls. The first cost is expensive and the method is used mostly for trade marks and other permanent designs.

Printed Paper Transfers

It is estimated that about 60,000,000 automobile inner tubes are produced annually in the United States, each of which requires one or more transfer labels. The manufacture and stocking of transfers to meet this demand has become an important industrial service.

The results desired in branding inner tubes with printed transfers are: (1) The tube must be marked perfectly under all conditions of temperature and length of cure; (2) the paper must be easily and quickly removed; (3) the marking must be indelible and as clear as though printed direct from type on the rubber.

Printed paper transfers have been perfected to give these results. They permit the use of every style of type and line ornamentation. They are, in fact, a printing specialty developed after much experimenting and ex-



Bliss Inclinable Power Press

search. The ink used must mark without smearing and as perfectly after a year or more as when newly printed. The quality of the paper is equally important, releasing the ink to the rubber and itself leaving the rubber without sticking.

Marking Inner Tubes

The necessary transfers printed, with name, sizes, etc., are placed by the tube maker along the edge of the rubber sheet between the mandrel and the tube before the latter is rolled up. Under the pressure of wrapping and heat of cure the ink is absorbed by the rubber surface and the impression perfectly transferred. The better qualities of transfers strip readily from the rubber; others require to be soaked in water and scrubbed off with a brush.

Typical Paper Transfer for Inner Tubes

Ornamenting Hollow Goods

Ornamentation of toys, play balls, etc., admits of great variation and includes molded figures, solid and inlaid colored rubber stock, painting, striping, and the application of pictures by line cuts, and decalcomanie. Molded ornamentation as previously mentioned is a matter of suitably engraving the mold cavity.

Rubber stocks, until recent years, have been limited to only a few colors on account of the injurious effect by sulphur and heat of vulcanization on the pigments. This difficulty no longer exists, as a full line of brilliant pigments have been developed that retain their color value unimpaired during vulcanization.

Marbleized Color Effects

The marbleized multi-colored effects sometimes seen in hollow balls, bulbs, water bottles, fountain syringes and bottle mats are produced by rolling together pieces of warm batched stock of each color into a cylindrical calender feed, or a section of the rolled stock cut to fill a flat mold. In the case of sheet stock a single passage through the calender produces a flow of the stocks, causing twisting and streaking of the colors, thus giving a grained or marbleized effect. Success depends on the stocks having the same rubber quality and essentially the same temperature to make them equally plastic for intermingling.

Painting and Striping Balls

Preliminary to the application of the finish color coat and striping, hollow balls are rapidly and evenly covered with a priming coat of neutral color by tumbling in a barrel with just sufficient paint to lightly cover each ball, leaving no excess paint in the tumbler. After drying in trays on racks, the color coats are applied by hand brushing to each ball singly and the balls are again racked and dried.

Striping is hand-work done with special turntable and striping brush. The turntable is a small standard with vertical shaft, on top of which is a circle of wood carrying three upright nail points, upon which the ball is adjusted in such a way as to bring the mold seam horizontal, to serve as a guide in striping. In this position the ball is given a rotary motion by turning its vertical support with thumb and finger of one hand while the striping brush is applied by the other.

Another method of ball striping is by means of a small speed lathe which holds and turns the ball as the operator applies rings of selected colors in lines or bands.

Plaid effects on balls require two striping operations. The second set of stripes is applied at right angles after the first set is dry. All painting operations on balls require careful drying to obtain satisfactory results and the paints employed should be high-grade elastic varnish paints specially prepared for the purpose.

Pictured Balls

Two common methods are used for picturing balls, one is by applying transfer or decalcomanie pictures and the other by printing and painting. Balls that are to receive transfer pictures are primed, painted and striped and dried overnight on trays set in racks generally over night or until the surface has become well hardened.

Decalcomanie Transfers

Decalcomanie is the name given to transferable pictures lithographed in colors on special absorbent paper. The picture is attachable as a whole to any smooth or tacky surface, such as glass or varnish, when its hold on the paper foundation is released by soaking the adhesive binder in water. Balls painted with varnish colors are well suited to receive and bind such transfer pictures.

The operation of applying a transfer picture consists in laying it face uppermost on a pad of wet felt. The soaking is brief and only sufficient to release the adhesive attachment between picture

STRIPED MARBLEIZED MOLDED PICTURED

Examples of Hollow Ball Ornamentation

and paper. The decalcomanie is then laid on a dry felt pad and the picture transferred to the ball surface by pressing the latter against the picture selected.

Perfect contact of picture on the ball is secured by wiping it over with a soft cloth or, better, by pressing the picture with a slight pressure and turning motion of the ball in a cup-like depression of cloth attached at the edges over an empty can or similar hollow form.

Picturing by printing and painting is applicable where the use of decalcomanie is not, that is to say, on unpainted surfaces. To

Hot Water Bottle Embossing

accomplish it an outline picture is imprinted by a hand stamp or line cut and subsequently the colors are brushed in.

Coloring and Ornamenting Toy Balloons

Toy balloons are colored by soluble aniline colors compounded with the rubber before the stock is converted into cement of dipping consistency. Very recently aniline dyes have been perfected which may be applied to cured balloons in a hot bath of water slightly acidulated with acetic acid.

On most toy balloons pictures and printing of some sort are required, especially for advertising purposes. This is accomplished very simply. Ordinary type or line cuts are inked and the impression taken on the rubber by applying the inflated balloon to the type or cut with slight pressure by simply rolling over the surface. The inflation is conveniently done by means of a small electrically operated air pump. When deflated the impression is extremely sharp and distinct in outline and assumes normal proportions and legibility when the balloon is stretched to normal inflation.

Marking Weatherproof Clothing

Woven labels in colors are employed to brand or mark weatherproof clothing. They are generally used on single and double texture garments only. This method of labeling gives wide scope for display of artistic designs and trade marks in colors, featuring the attractiveness of a garment and certifying its quality in an effective way. Woven labels admit of all the variety of color and design possible with printed labels, including portraits, autographs, or any other feature desired. Woven label service is thus possible similar to the inner tube label service previously mentioned.

MECHANICAL GOODS EXPORTS TO SOUTH AMERICA

United States exports to South America of mechanical rubber goods showed a steady increase in 1923, as compared with the year previous. Values for rubber belting more than doubled in 1923, when the figure was $510,205, against $226,170 in 1922. South America's total purchase in 1922 of rubber hose was estimated at $226,647, the value rising in the following year to $281,884. Values of packing also advanced from $57,629 in 1922 to $80,955 in 1923. The leading countries of South America, including Argentina, Chile, and Brazil, all showed decided increases in their 1923 importations of these American goods.

Dynamometer Tests of Automobile Tires[1]

By W. L. Holt and P. L. Wormley

THIS paper relates to a continuation of the work described in Technologic Paper No. 213 in which a description was given of the method of determining power losses in tires using electrical absorption dynamometers. This work has shown that there are very marked power loss differences in tires. One method of comparison is power loss versus air pressure. Tests made upon 72 different tires, chosen at random, manufactured by 35 large and small companies are considered representative of average tires.

From these tests the following conclusions are drawn: (1) The average loss in 30 by 3½ fabric tires is 0.71 horsepower; in cord tires, 0.48 horsepower. (2) The average loss in 4-inch fabric tires is 0.94 horsepower; in cord tires, 0.67 horsepower. (3) As an average, the loss in cord tires is approximately 70 per cent of that in fabrics. (4) Extreme cases, between the highest fabrics and the lowest cords, show the cord with only 40 per cent of the loss found in the fabric. (5) Considering only the cord tires, the lowest loss for each size of tire is about 60 per cent of that of the highest. (6) In general, the curves of power loss have the same trend. Individual tires show some differences in the rate of increase or decrease of power loss.

Analysis of power losses referred to tread, tube, carcass, size, deflection, creep, and miscellaneous factors, under each of which tests are reported, shows that the greater part of the power loss occurs in the carcass of the tire. That such is the case is brought out by the difference in power losses in cord and fabric tires where practically the only difference is in the carcass construction. When run under the same conditions not a single cord tire has been found whose power loss was as great as the lowest power loss found in any fabric tire of the same size.

Power losses in cord tires apparently depend to a large extent on the cord construction and on whether or not the cords are well impregnated with rubber. It has been found that the amount of rubber between the different plies of the carcass has a very marked effect. Wherever this thickness is low the power loss is invariably high. Uniformity of cord construction lessens power loss by uniform distribution of strain.

The significance of power loss in tires is its influence on fuel consumption, higher temperatures, uniformity of product, and internal friction.

The power required to supply the amount absorbed by the tires and dissipated as heat must come from the fuel used and accordingly a change in the kind of tires, or the conditions under which tires are run, will manifest itself in an increase or decrease in fuel economy. It is not out of the way to attribute a difference in fuel consumption of as much as 10 to 20 per cent to changes in tires or tire conditions.

Inasmuch as the energy absorbed by tires is dissipated as heat, a rise in temperature results. Whether or not this temperature is high enough to be seriously detrimental to the rubber will depend upon the design of the tire, how it is run, the kind of road, weather conditions, etc. For the average car at lower speeds and frequently stopped, the temperature is probably not of great importance.

The power loss in a tire may be considered as the hysteresis loss of the whole tire. Since this loss is made up of the sum of all the small losses throughout the tire, the problem is to reduce the loss in unit parts. One of the big problems in tire construction is to so build them that the rubber bond will not be broken as the positions of the fibers and cords change. There are two factors which should be observed in order that the power loss be low: the rubber compound must be of such a nature that the hysteresis loss is small, and the unit strain on the rubber must be low.

[1] Technologic Papers of the Bureau of Standards No. 240, Part of Vol. 17.

What the Rubber Chemists Are Doing

The Use of Diphenyl Guanidine as an Accelerator of Vulcanization[1]

By W. M. Ames

EXTRACTS from this paper and the author's summary are interesting because diphenyl guanidine (D.P.G.) is a popular ultra-accelerator widely used in American rubber manufacturing practice.

In order to show how D.P.G. compares in activity with some of the earlier discovered accelerators, the first portion of this paper is devoted to a comparison between it and *p*-nitroso dimethylaniline, or "accelerene," as it is generally known. From this preliminary investigation it is concluded that accelerene and D.P.G., while not very different in activity, are somewhat different in action.

Accelerating Effect

From a series of experimental mixings it was demonstrated that for every mixing an increase in the quantity of D.P.G. produces an increase in strength, the increment being greater when the quantity of accelerator present is small than when it is large.

As sulphur is added up to 7½ per cent the curves of maximum average load move further away from the D.P.G. axis and do not intersect, showing that the breaking load becomes greater as the proportion of sulphur is increased, no matter what quantity of accelerator is present.

Toughening Effect

Toughening effect increases for all quantities of D.P.G. up to 7½ per cent of sulphur and diminishes for quantities of sulphur greater than that. Toughness and strength thus vary similarly in mixing accelerated with D.P.G.

Plotting time, at 135 degrees C., required to reach the maximum strength, against quantity of accelerator showed that the acceleration produced is greatest with small quantities of sulphur, and the lower part of the curves being almost parallel to the time axis, the maximum increase in acceleration is obtained with proportions of accelerator less than one-half of one per cent. The slope of the lower part of the curves gradually diminishes as sulphur is added, so that for large proportions of sulphur a small quantity of D. P. G. is almost as effective in reducing the time of cure as a large quantity.

The three properties most likely to require consideration in producing a new mixing are time of vulcanization, strength, and toughness. Results indicate that if a mixing containing D.P.G. is to be produced possessing good tensile properties, other circumstances must be such that it can be heated for about one hour at 135 degrees C., subject to the influence of the compounding ingredients used.

Effect of Zinc Oxide

The effects produced by the addition of zinc oxide to a mixing accelerated with D.P.G. are not very desirable. Firstly, no increase in strength is produced, there being in fact a slight diminution, which, however, is negligible, particularly as the accelerated mixings are usually very strong. The toughening effect is less than would have been expected; that is, the zinc oxide has a smaller effect on the accelerated mixing—which has already been toughened—than it has when no accelerator is present. The magnitude of the toughness induced by zinc oxide varies with different types of mixings, increasing as the sulphur decreases or with decrease in the quantity of accelerator. It is a well-known fact that the addition of an active filler to a mixing already containing another active filler produces less increase in toughness than if the second filler had been added to a pure stock. In the case under consideration, sulphur and accelerator behave as if they were equivalent to an active filler, so that the full benefit of the toughening powers of the zinc oxide is not obtained.

Another disadvantage of using D.P.G. in zinc oxide mixings is the reduction in the rate of cure produced by so doing. This retarding effect of the zinc oxide is greatest when the quantities of accelerator and sulphur present are small. It can be shown that zinc oxide alone has no effect on the time of cure as measured by the time taken to reach maximum strength, so that the retardation noted above must be due to the zinc oxide and D.P.G. conjointly. It is, in fact, a reversal of the activation process. The activity of D.P.G. must be brought up to a maximum by the addition of zinc oxide and then slowly reduced. The magnitude of such an effect would obviously be influenced by the amount of sulphur and accelerator present, and, in particular, it would be greater with small amounts of accelerator.

From the behavior of the mixings investigated, it is concluded that D.P.G. should not be used in zinc oxide mixings unless it is permissible to have present as much as 1 per cent of D.P.G. on the rubber along with a fairly high sulphur content.

Effect of Magnesia

The general effects of the additions of light magnesium carbonate to D.P.G. mixings are very different. For all mixings except when accelerator and sulphur are both present in small quantities, the addition of magnesia produces an increase in strength, an increase in the rate of cure, and a toughening effect very similar to what would be obtained if no accelerator had originally been present. The increased strength is most marked when a small quantity of accelerator is used along with a large quantity of sulphur. The augmented toughness is perhaps most marked with a small quantity of sulphur and a large quantity of accelerator. Although it fails to effect any improvement in mixings where both the sulphur and accelerator content are low, the mixings examined above are sufficient to show that in magnesia mixings the good properties of this accelerator are exhibited to their fullest degree.

Aging Quality of D. P. G.

D.P.G. mixings show good aging qualities when subjected to artificial aging. On the whole, it is probable that mixings containing a small quantity of sulphur age better than those containing a large quantity, but there appears to be not the least danger in using a large quantity. The smallness of the increase in toughness as D.P.G. mixings age may prove a valuable property.

Summary

1. Diphenyl guanidine possesses accelerating powers of the same order as *p*-nitroso dimethylaniline.

2. Diphenyl guanidine improves the strength and toughness of mixings and imparts flat-curing properties.

3. The optimum quantities of diphenyl guanidine and sulphur are ½ to ¾ per cent of the former, and 5 to 7 per cent of the latter.

4. This accelerator gives similar results with mixings compounded with zinc oxide and light magnesium carbonate. It is more satisfactory, however, with large quantities of magnesia than with zinc oxide.

5. Brown and white substitutes appear to have a retarding effect, and such mixings do not give good results.

6. Diphenyl guanidine mixings possess excellent aging qualities

[1] *Journal of the Society of Chemical Industry*, April 25, 1924, T-124 T.

when subjected to artificial aging tests, particularly if the sulphur content is low.

7. There appears to be little danger of premature vulcanization when this substance is present in mixings.

8. Diphenyl guanidine possesses the property of softening rubber.

Diphenyl Guanidine[1]

Composition and Physical Properties

Symmetrical diphenyl guanidine is a disubstituted guanidine and may be considered as thiocarbanilid in which the sulphur of the =C=S group has been replaced by the imido (=N=H) group. The commercial material as offered to the rubber trade for accelerating the vulcanization of rubber is a white, extremely finely divided powder, of high degree of purity. The impurities present consist of traces of ash and moisture and a small amount of organic impurities, the material assaying approximately 97 per cent diphenyl guanidine. It is almost odorless, and is non-poisonous to workmen handling it in rubber manufacturing. Vulcanized articles containing it are odorless and free from poisonous or objectionable fumes.

Diphenyl Guanidine in the Factory

Since the material is positively non-hygroscopic, no special methods of handling it are necessary. It can be weighed and added directly to the batch to be mixed. It disperses easily and completely in the rubber mix, thus insuring a uniform cure throughout the article. If handled in the form of a master batch, 20 to 30 per cent or even more can be easily incorporated in the rubber. The rubber of the master batch should be well masticated and then the D. P. G. fed on slowly with a scoop, thus eliminating any tendency of the material to cake on the back roll. The final mix when cold is somewhat stiffer than crude rubber, and can be stored in any amount without fear of flowing together or deteriorating in any way.

Diphenyl Guanidine as an Accelerator of Vulcanization

Unlike many commercially available organic accelerators, diphenyl guanidine can be used advantageously in all classes of rubber compounds, and in conjunction with all the known compounding ingredients.

EFFECT ON COLORS. In conjunction with practically all organic and inorganic colors diphenyl guanidine can be used without dulling or changing their tone. This makes it valuable for non-blooming inner tubes, druggists' sundries, etc., where clean, bright colors are essential.

CRITICAL TEMPERATURE. Although diphenyl guanidine is an exceedingly active accelerator, its critical temperature is enough above those attained on the calender and mill to insure almost complete freedom from scorching. This makes it possible to compound very quick curing compounds, and is especially valuable in heavily compounded stocks such as tire treads, mechanical goods, etc.

EFFECT OF ZINC OXIDE. Although diphenyl guanidine is very active in a pure rubber-sulphur mix, the presence of zinc oxide assists in producing its maximum accelerative effect. It is recommended that not less than three parts by weight of zinc oxide be used per 100 parts rubber and 5 parts for maximum effect. Lime and similar substances do not activate diphenyl guanidine materially.

PROPORTION OF SULPHUR TO RUBBER. Unless non-blooming stocks are required, the best stocks can be produced by using from three to four parts of sulphur to 100 parts of rubber. In general, 3.5 parts sulphur to 100 parts rubber gives a stock with a very flat curing curve, and insures good aging qualities.

[1] Data Supplied by Dovan Chemical Corporation, New York, N. Y.

PROPORTION OF ACCLERATOR TO RUBBER. Unlike many other accelerators, diphenyl guanidine is very active when present in very small amounts, and its activity increases almost proportionally to the increase of diphenyl guanidine up to about 0.75 parts to 100 parts of rubber. The best results are obtained by using from 0.5 parts to 0.8 parts of diphenyl guanidine to 100 parts of rubber, and 3.5 parts of sulphur.

AGING QUALITIES OF DIPHENYL GUANIDINE STOCKS. Compounds accelerated with diphenyl guanidine age extremely well, especially when the proportion of sulphur to rubber is proper. Although it is recommended to use not over 3.5-4.0 parts of sulphur, stocks have been made containing as much as 6.0-7.0 per cent sulphur that aged very well.

Typical Compounds

INNER TUBES

GRAY—LIGHT BLOOM. Rubber, 100; sulphur, 3.5; zinc oxide, 5.; diphenyl guanidine, .6; carbon black or lamp black to suit.

This compound should be cured 30-35 minutes at 288 degrees F. in open steam, depending upon the nature of rubber used. It is a lightly blooming tube, has excellent resistance to tear, and ages extremely well. From 0.5 to 1.0 parts cotton seed oil may be added to decrease any tendency to check when exposed to light.

HEAVY BLOOMING TUBE. Rubber, 100.; sulphur, 5.; zinc oxide, 5.; diphenyl guanidine, .125.

This stock cures in 40 to 45 minutes at 288 degrees F. and ages very well.

NON-BLOOMING TUBES. Rubber, 100.; sulphur, 2.5; zinc oxide, 5.; diphenyl guanidine, .75.

To the above mixture may be added carbon black, red oxide, golden or crimson antimony free from free sulphur, or any of the organic colors to produce desired color. It should be cured about 60 minutes at 288 degrees F. to be non-blooming. The physical properties and aging qualities are very good and colors are particularly clear.

Tire Friction, Skim Coat, Cover Stocks, Etc.

The following type compounds can be used to produce rubber stocks of any cure desired: Rubber, 100.; sulphur, 3.5 to 4.0; zinc oxide, 5. to 25.; diphenyl guanidine, .4 to 0.75.

The best technical cure is from 30 to 35 minutes at 288 degrees F. Add mineral rubber, softeners and fillers to suit.

SIDEWALL STOCKS. Rubber, 65.; sulphur, 2.25; zinc oxide, 30.; diphenyl guanidine, .3; Color to suit.

TREAD STOCKS. Rubber, 92.5 = 100 volumes; sulphur, 3.5; diphenyl guanidine, .75 to 1.0.

The necessary pigments may be added to obtain rigidity desired. The cure will depend upon what compounding ingredients are added, and their amounts, because they differ in retarding or accelerating effect.

Cure on the above type compounds with 5 to 10 parts zinc oxide added to activate the diphenyl guanidine is 30 minutes at 288 degrees F.

HARD RUBBER. Diphenyl guanidine is an exceedingly valuable accelerator for hard rubber because heavily loaded stocks can be milled without danger of scorching and the texture of the hard rubber produced is good.

MOLDED GOODS. Diphenyl guanidine is universally applicable to all sorts of compounds and shows high curing power in presence of reclaimed rubber and every sort of cheap compounding material, such as mineral rubber, resins, pitches, waxes, etc. Most important of all in this class of goods is the fact that no unpleasant fumes are given off from the hot goods when the molds are opened, which protects the workman and increases his efficiency.

Following is a type formula for heel stocks: Rubber, 25.; tire reclaim, 25.; sulphur, 1.25 to 1.5; diphenyl guanidine, .5 to .6;

zinc oxide, 10.; carbon black or red oxide, 5.; clay, 30.; softener, 1.25.

Cure: 10 to 15 minutes at 65 to 70 pounds steam pressure.

Factors Affecting the Rate of Vulcanization of Plantation Rubber[1]

Insoluble nitrogenous matter separated from depolymerized rubber, when introduced into crêpe rubber is without any accelerating effect on the vulcanization of the latter. A more effective accelerating agent can be produced by aerobic than by anaerobic decomposition of the natural protein or of the serum residue. The extent to which vulcanization can be expedited by the addition of serum solids or their decomposition products is limited. Artificial organic accelerators and protein decomposition products are much more powerful accelerators than the serum decomposition products. The extreme limit of acceleration by natural means is represented by evaporated whole rubber, which includes all the non-caoutchouc constituents of the latex. The rate of vulcanization of raw rubber, that is, matured rubber, is not reduced by careful washing; the exterior rubber of a matured slab vulcanizes much more rapidly than rubber from the interior. Extraction with cold acetone causes an increase in the rate of vulcanization of ordinary crepe, but does not do so for matured rubber prepared from the same coagulum. The evaporation of undiluted latex yields a product with approximately the same rate of vulcanization as matured slab rubber.

The results generally are held to demonstrate that the nitrogenous constituents of raw rubber are only partly responsible for its vulcanization characteristics and that the rate of vulcanization is seriously influenced by the presence of caoutchouc oxidation products which may be first formed through the agency of a peroxidase in the latex; the resulting labile peroxide accelerates vulcanization, but, on exposure to air or oxygen, undergoes further conversion into resinous oxygen compounds of the known type. On the degree of formation of these two types of oxygen compound depends the effect of aging which sometimes results in an acceleration and sometimes in a retardation of vulcanization.

[1] *Malayan Agricultural Journal*, 1923, 11, 310-334.

Chemical Patents

The United States

TREATMENT OF RUBBER. Process for preserving the elasticity of rubber articles consisting in removing the excess of sulphur, immersing alternately in hot, then cold water, rubbing, stretching and drying.—Ruben Zertuche, Washington, D. C., assignor to Secretary of War of the United States of America. United States patent No. 1,490,358.

RUBBER COMPOSITION. A rubber composition comprising rubber and a composite black pigment consisting of a body-giving pigment base and a carbonized black pigment combined with the base.—Karl B. Lamb, New York, N. Y. United States patent No. 1,490,703.

SOFT RUBBER PRODUCT AND METHOD OF MAKING IT. A filled rubber product which has been subjected to the action of two reagents, sulphur and a soluble condensation product of the phenol-formaldehyde type, the sulphur content being less than five per cent of the total rubber-sulphur.—Edward O. Benjamin, Newark, N. J. United States patent No. 1,493,062.

METHOD OF MAKING AND VULCANIZING DIPPED RUBBER ARTICLES. The method of forming and vulcanizing consists in preparing separate rubber solutions, one containing an organic accelerator and the other containing sulphur, then applying to the forms by dipping separate layers of these solutions, and finally vulcanizing the articles by heat.—Thomas W. Miller, Ashland, Ohio. United States patent No. 1,493,370.

The United Kingdom

VULCANIZING INDIA RUBBER. This process for accelerated vulcanization consists in incorporating with rubber, etc., (1) a metal in combination, (2) an amine, (3) a material providing sulphur, and (4) a material comprising carbon disulphide or oxysulphide. Two or three of the materials are first mixed with the rubber and the remaining ingredients are introduced by permeation from a medium other than rubber without changing the shape of the rubber mass. The following are typical examples of the process: (1) A thin sheet of rubber containing zinc oxide and sulphur is painted with solutions of dibenzylamine and carbon disulphide. (2) A thin film of rubber containing zinc butyl xanthogenate and benzylamine is treated with a solution of sulphur.—Naugatuck Chemical Co., Elm street, Naugatuck, Connecticut, assignees of S. M. Cadwell, Leonia, New Jersey, and O. H. Smith, New York, N. Y. British patent No. 211,494.

VULCANIZING INDIA RUBBER. Several batches of rubber are mixed, one containing sulphur but no accelerator, and another containing an accelerator but no sulphur. The batches are mixed just prior to using them. The final mixing takes place at a lower temperature than that of the original formation of the batches, which may be warmed separately just prior to combining them. Example: One batch consists of 50 parts of rubber, 5 parts of zinc oxide, and 5 parts of sulphur, and another of 50 parts of rubber, 5 parts of zinc oxide, and 3 parts of zinc amyl xanthate.—A. E. White, 88 Chancery Lane, London (B. F. Goodrich Co., 1780 Broadway, New York, N. Y). British patent No. 211,524.

UNVULCANIZED SHEET RUBBER COMPOUND. A lining for tanks, pipes, agitators, etc., may have the following composition, in parts by weight: Rubber 29, sulphur 3.1, silica 35, alumina and oxide of iron 1, and carbon 5. The vulcanized lining may be subjected to the action of boiling neutral strong brine to enhance its acid-resisting quality, and may be faced with wood to protect it from mechanical injury.—F. E. Elmore and Chemical & Metallurgical Corporation, Ltd., 701 Salisbury House, London. British patent No. 212,355.

The Dominion of Canada

ACCELERATOR. An accelerator for use in the vulcanization of caoutchouc and comprising the base of the character produced by the reaction of one mol of paranitroso-dimethyl-aniline with one mol of hydrogen sulphide.—The Goodyear Tire & Rubber Co., assignee of Clayton W. Bedford, both of Akron, Ohio, and Robert L. Sibley, Elizabeth, New Jersey. Canadian patent No. 239,430.

PROCESS OF VULCANIZING. The process of producing a sulphur-nitrogen accelerator which consists in bringing together under reacting conditions sulphur and a methylene group-containing Schiff base in the presence of an aromatic amine. As an accelerator in the vulcanization of rubber the resinous mass produced by the reaction of sulphur on methylene diphenylamine.—The Goodyear Tire & Rubber Co., assignee of Clayton W. Bedford, both of Akron, Ohio. Canadian patent No. 239,431.

NON-STICKY LINER FOR SHEET RUBBER. The combination of tacky sheet rubber, and a liner thereon comprising woven cotton fabric coated with non-tacky, oil-softened pyroxylin.—The B. F. Goodrich Co., New York, N. Y., assignees of Abram E. Faylor and Fred H. Amon, both of Akron, Ohio, and John B. Dickson, Northampton, Massachusetts. Canadian patent No. 239,885.

Germany

Patents Issued with Dates of Issue

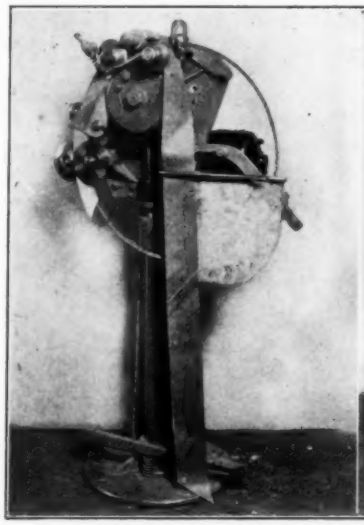
394,391 (January 19, 1922). Rubber mass. Elektrizitätswerk. Lonza A.-G., Basle, Switzerland; represented by: Dr. G. Alfthan and H. Heuschmann, Waldsgut.

394,392 (December 30, 1922). Method of making rubber masses. Elektrizitätswerk Lonza A.-G., Basle, Switzerland; represented by: Dr. G. Alfthan and H. Heuschmann, Waldgut.

New Machines and Appliances

Bead Flipping and Tire Band Machines

THE perfected high speed flipping and the band building machine here illustrated are made by the same company. The bead flipper is highly effective for wrapping tire beads with bias cut flipper fabric. The machine is driven by a half horse-power motor. The movement of one lever serves to open the bead. The cover strip is then fed into the machine and by the action of the rollers is lapped tightly around the bead with the strip extending ready to lay against the tire carcass. The machine will apply strips up to six inches in width, and also double and triple strips. It can be operated by a girl and will do from two to three beads a minute.



Utility Bead Flipper

Utility Band Builder

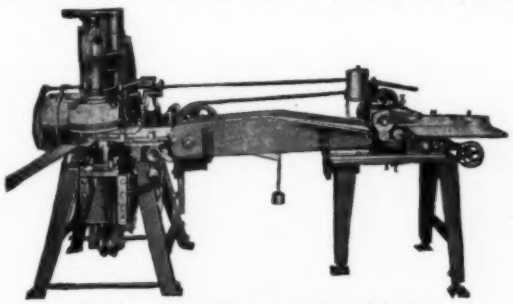
Tire Band Building Machine

The motor driven band building machine has the distinct operating advantage of keeping the band taut while it is being assembled; therefore, there is no wrinkling of the stock and the band is produced firm and solid, all air being expelled. These machines are employed in many of the important tire factories, where they have demonstrated a saving of 1¾ to 2⅛ cents a band over previous methods of band building.

Girl operators are building with these machines from 35 to 40 bands an hour and men operators up to 60 an hour. The latter is three to four times the speed of production of drum-built bands.—Utility Manufacturing Co., Cudahy, Wisconsin.

Automatic Dieing-Out Machine

The machine shown in the accompanying illustration has been used successfully in shoe and heel factories for dieing out heel lifts from sheets of pulp and fiber material. With some changes it has been adapted for dieing out rubber heel blanks and other blanks of different sizes and shapes from material either sheeted or tubed and is successfully used in a number of heel and other rubber goods factories in New England.



Machine for Cutting Rubber Blanks

The die used is an ordinary cutting die which cuts the blanks smoothly and of a uniform size. The die is driven up from underneath the stock against the block above. These dies can be changed quickly and little time is required to make all the necessary adjustments.

At the right of the picture, and connected by a conveyer is a stripping machine. When cutting sheet material the operator passes the sheet through the stripping machine which cuts a strip of the proper width. This strip is carried automatically by the conveyer to the dieing-out machine which dies out the blanks. When cutting tubed strips, the strips are fed directly to the automatic feeding mechanism of the dieing-out machine.

The machine is very rapid, having a capacity varying from 50,000 to 60,000 pieces per day of eight hours.—W. J. Young Machinery Co., Lynn, Massachusetts.

Portable Dust Blower

A one-hand operated portable electric blower is here pictured. This is a most profitable and handy tool for keeping electric motors, textile and other machinery free from dust. It should prove particularly useful in rubber mills where dust abounds.

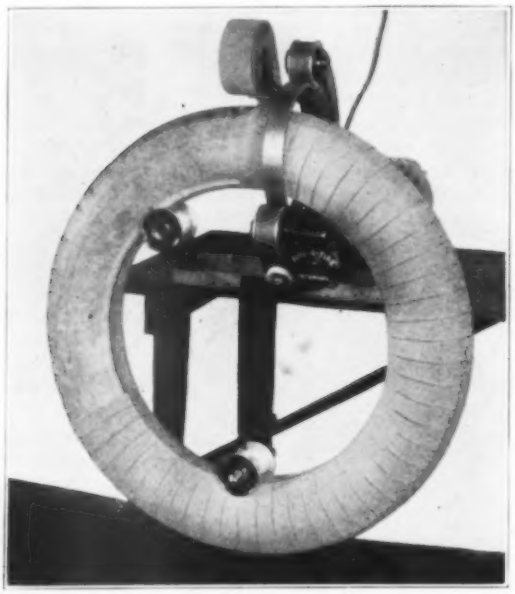
The blower weighs six pounds, is well balanced for ease of handling, and is controlled by a toggle switch in the handle. The wires from motor to handle are encased in metal tubing. Electric connection is made by an armored plug cap and highest grade cable. The tool delivers air sufficient to maintain 16 inches of water column pressure. — Electric Blower Co., 352 Atlantic avenue, Boston, Massachusetts.

Electric Dust Blower

Small Tire Wrapper

A small bench machine for wrapping tires has recently been perfected in the models for both hand and power operation. The latter model is the one shown in the illustration.

The machine wraps all sizes and types of tires. It is much needed by tire dealers, jobbers, factory branches and manufacturers. For shipping tires it eliminates expensive crates or burlaps and enables the dealer to keep his stock in neat and attractive condition.

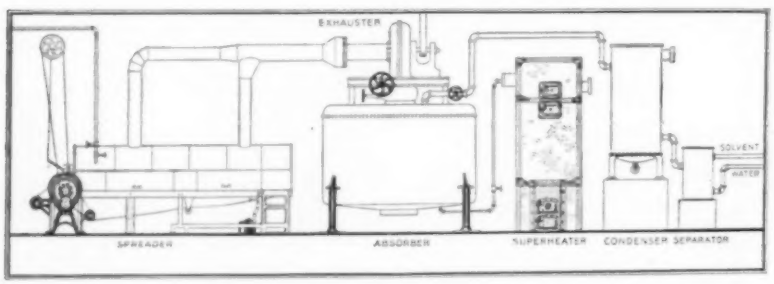


Rap-a-Tire, Power Model

In the illustration the machine is shown with tire in place for wrapping. It is supported on three grooved spacing wheels, one of which is driven by the motor which also operates a revolving holder carrying the spool of wrapping paper. The machine is easily operated from any electric light socket and wraps a tire evenly and tightly in 35 seconds.—The Akron Rap-A-Tire Co., Akron, Ohio.

Gasoline Recovery System

Static discharges occurring on rubber spreading machines, using gasoline as solvent, are a common cause of fires. It is obvious that a gasoline recovery system applied to spreaders must be so designed that a fire on the spreader will not have any effect on the operation of either the machine or the recovery system. The charcoal gasoline recovery system shown in the illustration has been demonstrated successfully in connection with rubber, proofing, dipped goods and cement plants.



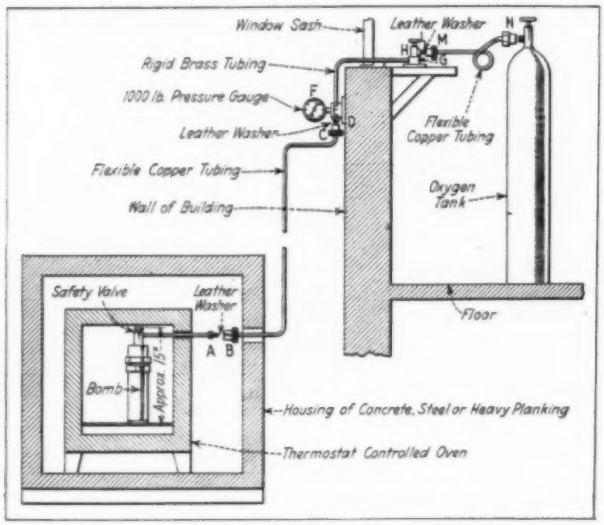
Charcoal Gasoline Recovery System

The recovery system comprises a galvanized hood placed over each spreader. From the hood a galvanized duct leads to an exhauster which draws the gasoline vapor from the hoods and blows it through the charcoal-filled absorption chamber. The charcoal retains the gasoline and permits the air to pass through. The gasoline is recovered from the charcoal by leading live steam from a superheater directly into the charcoal. The distilled gasoline and steam mixture is led into a condenser from which the gasoline and water run into a separator where the water separates by gravity from the gasoline.

This system has been in operation in a large rubberizing plant where it has saved a minimum of 60 per cent of the gasoline evaporated and greatly reduced the fire and explosion hazards. In this instance the solvent employed is 68 to 70 degrees straight run gasoline with boiling point range of 110 to 320 degrees F.—Solvents Recovery Co., Framingham, Massachusetts.

Oxygen Rubber Aging Test Apparatus

The laboratory method of aging vulcanized rubber by heating it in oxygen makes use of a steel bomb to contain the oxygen under pressure during the test. The diagram shows a typical arrangement of the complete apparatus.

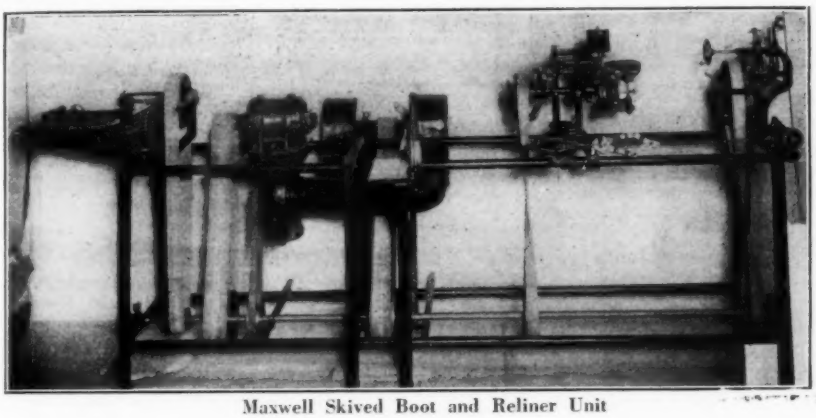


Typical Oxygen Aging Apparatus

The bomb is placed in a thermostatically controlled oven and has pipe connections providing for remote control of filling and exhausting of the oxygen while the bomb is still in the oven. This arrangement has been found to be most satisfactory in view of the present knowledge of the subject. The location of the bomb in the oven should be at a safe distance from the laboratory, preferably outside the laboratory building. This safety precaution is due to the liability of excessive high pressure being generated in the bomb in case the rubber samples become ignited by spontaneous combustion.—The Emerson Apparatus Co., 171 Tremont street, Melrose, Massachusetts.

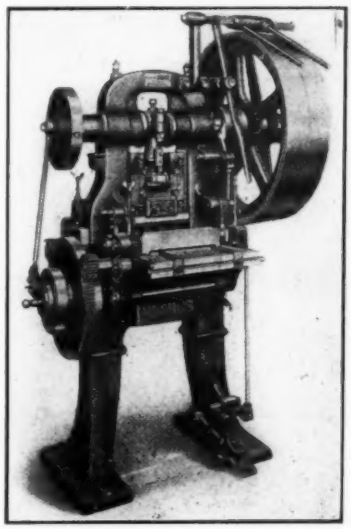
Liquid Level Gage

An improved pneumatic long-distance liquid level gage is made in both indicating and recording type. It has the advantage that no auxiliary pressure or power is required for its operation. The indicating or recording mechanism may be located above or below the point of measurement, and at a distance equal to 1,000 feet from the diaphragm box, with accuracy assured.—The Foxboro Co., Inc., Foxboro, Massachusetts.



Maxwell Skived Boot and Reliner Unit

Sole and Heel Clicking Machine



Moenus Clicking Machine

The dieing out or clicking machine here illustrated, embodying new principles, is of German origin and designed particularly for cutting out rubber heel pads, rubber soles, and various articles from other sheeted materials such as celluloid, vulcanized fiber, etc.

The machine has instantaneous release and automatic feed. Its speed is about 120 revolutions per minute, corresponding to a capacity of 12,000 to 15,000 heel pads an hour. The safety of operation is absolute, accidents to the workers, as well as wearing of the tools, are practically eliminated, however high the rate of operating speed.—Moenus Machine Co., Frankfort, Germany.

Tire, Boot and Reliner Equipment

A complete motor unit designed for preparing skived boot and tire reliners is here pictured. This assembly comprises bead cutter, tread puller, fabric skiver, fabric shear, quick-acting clamp, tread starter, buffer, exhaust fan, 2 horse power, 3 phase, 220 volt motor, all supported in a rigid frame so constructed that it can be adapted to suit any requirements. The items mentioned give a combined unit occupying a space 26 by 126 inches.

Combinations as short as 54 inches are made up by omission of some of the parts such as the motor and buffer. In this way the apparatus can be mounted on a truck as a traveling outfit for making up boots and reliners from discarded tires for vulcanizers not equipped for doing such work for themselves.—Maxwell Manufacturing Co., Wichita, Kansas.

Machinery Patents

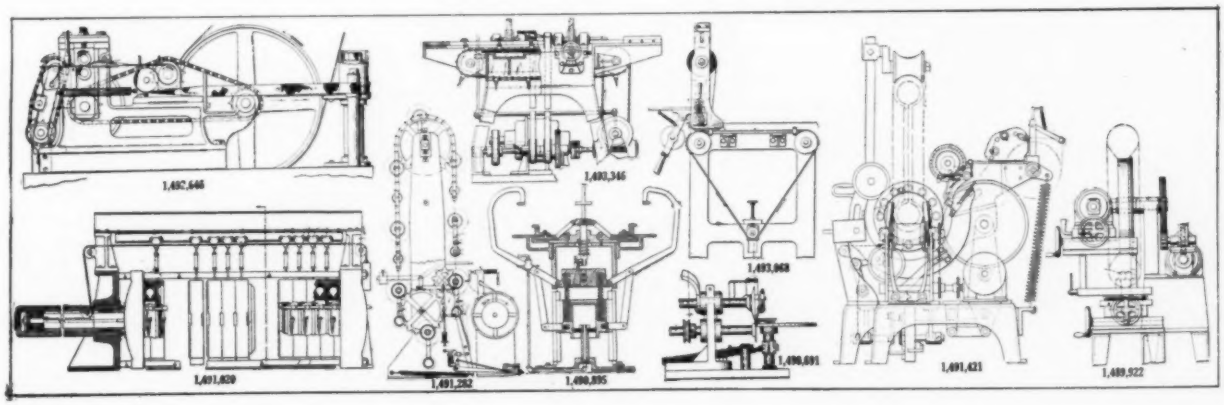
The United States

(1,489,922). AIR BAG BUFFING MACHINE. This is designed to buff off the outer surface of an air bag which has become hard and brittle by overcuring. The buffed surface then receives a coating of rubber cement over which is applied a new outside layer of rubber, after which the bag is revulcanized.—James W. Brundage, assignor to The Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,489,922.

(1,490,691). HEEL TRIMMING MACHINE. A pair of rotary disk cutters revolve in a plane at right angles to an adjustable table supporting the heels which are placed for trimming on a holder. The motion of the heel is guided automatically so that the edges are trimmed by the cutters. A roller contacts with the upper surface of the heel close to the cutting point and compresses the rubber to prevent yielding either way from the cutters.—Rees Beynon, assignor to Dryden Rubber Co., both of Chicago, Illinois. United States patent No. 1,490,691.

(1,490,895). TIRE OPENING MACHINE. An improved apparatus for opening casings for inspection of the interior, or for the insertion of the air bag or the inner tube. It comprises a circular horizontal table supported by a central standard and surrounded by a number of bead engaging fingers controlled by a hand lever system. A ram correctly positions the members with respect to the tire beads that are separated by hydraulic pressure.—W. H. Gerstenslager, assignor to The Goodyear Tire and Rubber Co., both of Akron, Ohio. United States patent No. 1,490,895.

(1,491,020). TIRE SHAPING PRESS. A horizontal two-platen hydraulic press holding a number of tire molds on edge, and closed against inflating pressure employed to shape the contained tires.



The molds are moved individually and in groups by a cable with stops to engage lugs on the molds, thus affording working space for insertion and removal of tire casings without removing the molds from the press.—Adrian O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Michigan. United States patent No. 1,491,020.

(1,491,282). APPARATUS FOR SUPPLYING STOCK TO TIRE BUILDERS. Rolls of stock are brought successively within reach of the tire builder by elevating and lowering them on a vertical endless chain conveyor or stock magazine. The liner strips are reeled onto the liner roll as the stock uncoils without tension and at the velocity of the carcass former's periphery on which the tire builder places it.—Adrian O. Abbott, Jr., and Clyde J. Smith, assignors to Morgan & Wright, all of Detroit, Michigan. United States patent No. 1,491,282.

(1,491,421). BEAD CLOSING MECHANISM FOR TIRE WRAPPING MACHINES. An attachment applicable to tire wrapping machines for closing the beads of the tire snugly together to make a compact package comprises a pair of pressers, located one on either side of the tire when positioned for wrapping. When the starting treadle is operated the pressers are moved toward one another to close the tire beads.—George W. Prouty, Boston, Massachusetts. United States patent No. 1,491,421.

(1,492,646). MACHINE FOR FORMING ANCHOR TABS AND APPLYING THEM TO ARTICLES. The apparatus comprises means for supporting a roll of tab-forming strip material; for folding it and for severing successive tab lengths from the advanced end of the folded strip; means for holding shoe buckles in position to be threaded by the tab-lengths and withdrawing the buckle in such manner as to fold the tab and press its end adhesively together.—Frank J. MacDonald and Virgil H. Bodle, both of Akron, Ohio, assignors to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,492,646.

(1,493,068). TIRE FABRIC BUILDING MACHINE. Plies of tire building fabric are laid up in the form of an endless band over a set of three rollers triangularly spaced with respect to each other, and are rolled into close contact. Suitable means are supplied for applying the rubber thread to the fabric band, and a concave roller compresses it firmly to the fabric. When completed the band is removable edgewise from the machine.—Louis P. Destribats, Trenton, New Jersey. United States patent No. 1,493,068.

(1,493,346). ABRADING MACHINE. An abrading machine for grinding a hard rubber battery jar on its several sides at one passage through the machine. The work is advanced by pins attached to an endless chain passing under a slotted guide plate. The slots act with pins as cams turning the work through 90 degrees to grind its adjacent sides.—W. D. Kmentt, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,493,346.

Other Machinery Patents

The United States

1,490,899. TIRE TESTING DYNAMOMETER. An apparatus for the investigation of the performance of automobile tires when required to transmit various amounts of energy at different speeds while subjected to different compressive loads stimulating the stresses and reactions encountered in the actual service of the tire. Carl F. Scott, Yonkers, N. Y., assignor to General Electric Co., New York, N. Y.

1,491,065. TOOL FOR LAP-SEAMING RUBBER GOODS. A double-edged stitching roller in combination with a knife having one portion of its cutting edge adjacent to the periphery of the roller. The object is to gage the depth of the cut to the thickness of the stock and to lessen the number of operations necessary to close, for example, the heel seam of a rubber boot. Chester J. Randall, assignor to the Goodyear's Metallic Rubber Shoe Co., both of Naugatuck, Connecticut.

1,492,745. MACHINE FOR APPLYING FLUENT MATERIAL. The purpose of this machine is to dust the outer surfaces of articles previous to vulcanization to secure a "velvet" surface. This is done in a hopper-fed dusting box through which the articles pass attached to an endless chain conveyor. Herbert R. Pollevs, New Haven, and C. J. Randall, Naugatuck, assignors to the Goodyear's Metallic Rubber Shoe Co., all of Connecticut.

The United Kingdom

211,687 Repair vulcanizing apparatus. F. G. Green, 173 Barclay Road, Bearwood, Birmingham, and E. L. Penhale, 32 Dudley Road, Brades Village, Oldbury, Worcestershire.

211,719 Apparatus for printing designs on rubber surfaces. E. Centore, 87 Rue de Faubourg St. Denis, Paris, France.

211,979 Apparatus for shaping tire covers. C. M. Gautier, 14 Unwin Mansions, London.

The Dominion of Canada

239,425 Machine for cleaning tire cores. The Firestone Tire & Rubber Co., of Canada, Limited, Hamilton, Ontario, Canada, assignee of William C. Stevens, Akron, Ohio, U. S. A.

239,429 Tension device. The Goodyear Tire & Rubber Co., assignee of W. B. Harsel and R. B. Day, all of Akron, Ohio, U. S. A.

239,536 Testing machine. The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada, assignee of Joseph G. Coffin, Hempstead, New York, U. S. A.

239,722 Machine for skive splitting annular articles. The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada, assignee of C. R. Hubbard, Cleveland, Ohio, U. S. A.

Germany

Design Patents Issued with Dates of Issue

867,308 (September 1, 1922). Mold for heels and soles. Mitteldeutsche Gummiwarenfabrik Louis Peter, A.-G., Frankfurt-am-Main.

867,385 (February 26, 1924). Apparatus for making dipped goods and recovery of the solvent. Albert Boecler, Malmö, Sweden; represented by: Dr. R. Specht, Hamburg.

868,801 (February 4, 1921). Device for making seamless rubber dipped goods. Albert Boechler, Malmö, Sweden; represented by Dr. R. Specht, Hamburg.

Patents Issued with Dates of Issue

394,329 (April 15, 1921). Apparatus for vulcanizing round rubber thread. Max Draemann, Landplatz 1, Köln-Deutz, and Max Bühling, Richterstrasse 88, Cologne.

394,430 (September 6, 1921). Dipping apparatus for recovering solvents. Bernhard Brackhues, Berg.-Gladbach.

394,571 (April 10, 1923). Machine for making tire covers with cord inserts. Dickinson Cord Tire Corporation, New York; represented by: B. Kugelmann, Berlin-Wilmersdorf.

394,665 (January 22, 1922). Carrying device for vulcanizing molds. Charles Edward McManus, New York, N. Y., represented by: Dr. R. Geissler, Berlin S. W. 11.

395,233 (September 20, 1920). Automatic comb cutting machine. Viktor Müller, Forsthaus bei Krefeld.

Process Patents

The United States

1,490,312 Method of making rubberized dressing for automobile tops, etc. Percy C. Bowne, Santa Ana, California.

1,490,680 Method of wrapping tires, etc. J. Scherner, Cudahy, and E. Hutchins, Eau Claire, Wisconsin, assignors to Pierce Wrapping Machine Co., Chicago, Illinois.

1,491,569 Method of tire manufacture. K. J. Thompson, Mansfield, Ohio.

1,491,626 Method of making bead cables for tires. A. C. Pratt, Deep River, Connecticut, assignor by mesne assignments to American Chain Co., Inc., a corporation of New York.

1,492,906 Method and means for remolding hard rubber water meter disks to precise dimensions. J. Thomson, Brooklyn, New York.

The United Kingdom

211,188 Waterproofing fibrous material with rubber latex. R. Russell, Lands End House, Rhodes, near Manchester, and H. Broomfield, 23 Davenport Road, Hazel Grove, Stockport, Cheshire.

The Dominion of Canada

239,881 Process of making endless belts. The B. F. Goodrich Co., New York, N. Y., assignees of Abram E. Falor, Akron, Ohio, both in the U. S. A.

New Zealand

51,546 Method of producing rubber sheets. The Anode Rubber Co., Ltd., 15 Throgmorton avenue, London, E. C. 2, England, assignee of Dr. Paul Klein of v Vilmos—Csaszar-ut 78, Budapest, Hungary.

Germany

Patents Issued with Dates of Issue

393,826 (December 2, 1922). Method of making waterproof fabrics. Eugen Nitzsche, Boxgraben 36, Essen.

The Editor's Book Table

Book Reviews

"YEAR BOOK FOR 1922-1923—THE INSTITUTION OF THE RUBBER Industry." Published by Faraday House, London, England. Paper, illustrated, 448 pages, 5½ by 8½ inches.

This second Year Book of the Institution of the Rubber Industry contains not only lists of officers and members of committees, but also complete accounts of the meetings held by the organization from September 4, 1922, through June 25, 1923. The various papers and discussions, reported in full, will be of interest to the rubber industry.

"TWENTY-FOURTH YEAR BOOK—1924." PUBLISHED BY THE Rubber Association of America, Inc., New York, N. Y. Prepared by the general manager and secretary. Paper, 55 pages, 6 by 9 inches.

As is customary, the Year Book of the Association contains the names of officers and directors, lists of association members, as well as the names of members of various committees. The second section of this 1924 publication contains the charter, constitution and by-laws, lists of officers and directors, and a necrology. Since last year the rubber heel and sole division has been included as another department.

"YEAR BOOK FOR 1924—DEPARTMENT OF AGRICULTURE, Ceylon." Published under the authority of the Director of Agriculture, Peradeniya, Ceylon. Paper, illustrated, 70 pages, 7 by 10 inches.

Much interesting information regarding the resources of Ceylon appears in this annual publication. In the issue under consideration and in the section devoted to rubber can be found the two following articles: "Growth and Yield in Hevea," by G. Bryce and C. H. Gadd; and, "A Brown Bast Census," by A. T. Reeve.

"RESOURCES OF THE EMPIRE—RUBBER, TEA AND CACAO." Compiled and edited by W. A. Maclaren. Published by Ernest Benn, Limited, London, England. Cloth, 334 pages, with index, 7½ by 10 inches.

Under an arrangement with the Federation of British Industries a series of twelve volumes regarding the resources of the British Empire is in contemplation and has in part been published. The present volume, the fifth in the series, begins with a general economic survey of the industry, followed by a geographical survey of the various countries and colonies connected with the British Empire, in which rubber is being cultivated. The concluding chapters review the position and outlook of the British crude rubber industry.

This careful study of one of England's leading resources has been preceded by a foreword written by the Prince of Wales, and a general introduction by the Right Honorable Sir Eric Geddes, president of the Federation of British Industries, and H. Eric Miller, vice-chairman of the Rubber Growers' Association.

New Trade Publications

IN THE FIFTEENTH ANNUAL REPORT OF THE RUBBER GROWERS' Association, Inc., there are many items of importance, including the reports of various committees regarding exports, finances, statistics, gifts, exhibitions, propaganda measures, etc. Lists of members of the association appear, and also the names of members constituting the permanent and temporary committees. The report is printed on latex paper.

TWO NEW CATALOGS ENTITLED "INDIA RUBBER TILING" AND "Sports, Golf and Tennis," are being sent out by The Leyland & Birmingham Rubber Co., Limited, Leyland, near Preston, England. The first of these represents in color some of the company's designs in rubber tiling as already laid in various banks, railway stations, hospitals, and offices. The Leyland organization has also installed tilings on a number of the ocean liners, while rubber blocks have been used on various roadways in London, the space around the Cenotaph being an especially noteworthy example. In the second catalog golf and tennis balls, and all requisites for playing both of these games are particularly featured.

IN "THE SEIBERLING NEWS" ESPECIAL ATTENTION IS CALLED TO the new changeover sets now being manufactured by the company, these comprising new tires and wheels. Several large broadsides, having reference to advertising methods, as well as such subjects as tire load and inflation, are also included in the company's new publications, and are being sent to dealers.

A CLEVER, WELL-PRINTED BOOKLET, ITS ATTRACTIVENESS ENHANCED by a number of amusing illustrations in color, is being sent out by the Tide Water Oil Sales Corporation, 11 Broadway, New York, N. Y. This publication, entitled "An Unusual History of Petroleum," represents a reprint of twelve short articles used last year in the company's advertising campaign.

ILLUSTRATED BULLETINS ENTITLED "DUNLOP MERCHANT NEWS" are "issued every so often" in the interest of its dealers by the Dunlop Tire & Rubber Co., Buffalo, New York. Some of the most recent of these publications contain illustrated accounts of the tire building process as exemplified at the Dunlop company's large Buffalo plant.

A BOOKLET PREPARED TO PROMOTE A BETTER UNDERSTANDING AND a closer relationship between all branches of the rubber industry has been recently published by the Institution of the Rubber Industry, Faraday House, 10 Charing Cross Road, London, W. C. 2, England. This bulletin shows the work accomplished by the organization, while an interesting item reports the membership growth from only 31 individuals on August 31, 1921, to 570 in March, 1924. The booklet is entitled "Why You Should Join the Institution of the Rubber Industry."

Recent Articles Relating to Rubber

Turning Old Rubber to Account. Writer grades the different kinds of waste, giving percentage of reclaims to be expected and describes the alkali process of regeneration. The use of tar-oil and the like instead of soda and of naphthalene for highly vulcanized waste, is briefly discussed.—*Gummi-Zeitung*, April 11, 1924. 485-487.

Manufacture of Imitation Leather. Describes the manufacture of imitation leather using rubber, such as pantasote, lincrusta, pegamoid, etc. Illustration of Repiquet calender.—*J. Soudier, Le Caoutchouc et la Gutta Percha*, April 15, 1924, 12145-12147.

The Technical Organization of a Tire Factory. First installment of a serial article.—*Le Caoutchouc et la Gutta Percha*, April 15, 1924, 12149-12150.

Formulæ for Rubber Mixings. Conclusion of serial article: mixings for covers for explosives, for red and gray thread, rubber cord, rings.—Dr. R. Ditmar, *Le Caoutchouc et la Gutta Percha*, April 15, 1924, 12158-12159.

Chemistry of Pinene. The first part of a series of articles on the chemistry of pinene which, although made public in Russia about 1910, have not appeared in foreign papers. Recently certain scientists have passed these conceptions off as new and original.—Professor I. L. Kondakow. *Le Caoutchouc et la Gutta Percha*, April 15, 1924, 12163-12166.

White Joint Filler for Concrete Roads. A light-colored rubber material has been developed by the Bureau of Public Roads as a filler for joints and cracks in concrete roads. It is an intimate mixture of crude unvulcanized rubber with rosin in the proportion of one part of rubber to about ten of rosin, to which mixture is added a considerable quantity of a neutral white pigment, preferably barytes or titanox. If the rubber is softened by allowing it to absorb twice its weight of a light petroleum lubricating oil, and the mixture effected in a steam-jacket iron vessel provided with revolving mixing blades, a smooth product can be obtained.

This material may be melted in open kettles at the roadside, but the melting takes longer than with bitumen, and care should be taken to prevent the material from catching fire and to avoid overheating. At 110 to 125 degrees C. it is fluid enough to pour and does not become much more fluid even though the temperature be considerably raised, but the quality of the material is injuriously affected if heated much above this temperature.—L. G. Carmick, *Public Roads*, May, 1924, 21-22. Illustrated.

Wear of Concrete Pavements Tested. A comprehensive practical study of the wear of concrete pavements conducted by F. H. Jackson and J. T. Pauls of the United States Bureau of Public Roads. Concrete test sections were subjected to approximately 300,000 passages of a solid rubber tired truck wheel loaded to 3,000 pounds and traveling around this circle over the same path at a speed of 22 miles an hour. In addition the test sections were subjected to about 50,000 passages of a rubber-tired wheel loaded with the same weight and equipped with non-skid chains and the same number of passages of a plain rubber-tired wheel. In the conclusions are two facts of major importance: (1) Rubber-tired traffic alone does not appreciably abrade the surface of a concrete pavement; (2) there is no consistent relation between the results of the "tensile-strength-ratio" test for sand, the compression or transverse strength tests or the Talbot-Jones wear test of concrete, and the wear-resisting properties of concrete pavement.—*Public Roads*, May, 1924, 1-19.

ROLLING RESISTANCE FOR BALLOON TIRES

Tests recently conducted by the Bureau of Standards, Washington, D. C., show that at equal inflation pressures balloon tires have a slightly lower resistance than the ordinary cord type but when the pressure in the balloon tire is decreased to the value at which the tire is intended to be operated its rolling resistance and consequent power consumption increases to figures considerably higher than those for ordinary cord tires operated at the pressures for which they are designed.

The average rolling resistance per 1,000 pounds axle load of an ordinary cord tire at 45 pounds inflation pressure is about 11.5 pounds, while for a balloon tire at 30 pounds inflation it is about 13.3 pounds; at 25 pounds inflation, 15.2 pounds and at 20 pounds inflation, 18.9 pounds.

All of the balloon tires used in these tests were run on a 29 by 4½-inch rim. In each case the normal load for the particular size of the tire was carried by the tire and this load was kept constant during the test.

JAPAN'S TIRE IMPORTS

Japan's imports of American auto tires both pneumatic and solid, and inner tubes, totaled in value $191,477 in 1921, the figures declining in 1922 to $161,906. In 1923, however, the totals for these three lines of goods reached $758,842, or more than four times the value for the previous year. Of this purchase, the 1923 value for pneumatic tires stood at $568,083, as compared with only $123,792 in 1922; solid tires imported in 1923 were estimated at $150,226, against only $35,382 in 1922; while inner tube values rose from $2,732 in 1922 to $40,533 in 1923.

UNIVERSAL TIRE CHANGER

The efficient tire changer here pictured has been developed to meet the need for a quick, safe and convenient means for changing tires on all types of split and solid detachable rims and also on wire and disk wheels. It will handle pneumatic tires of all sizes, including balloon tires up to seven inches for both passenger cars or light trucks.

The tire is forced off the rim by the downward pressure of the goose-neck hook, which is operated by an adjustable hand lever.

Weaver Universal Tire Changer

The gripping jaws are of special construction and hold the wheel or rim rigidly. The goose-neck is adjustable and can be moved up or down on the vertical ratchet bar according to the tire size and to give the operator maximum leverage.

By reversing the operation of the jaws an expanding pressure is exerted against the inside of the rim, thus extending the rim into proper position for remounting a tire.—Weaver Manufacturing Co., Springfield, Illinois.

JOINTING HIGH PRESSURE CABLES

In laying mains supplying power and light current at very high voltage, joints must be constructed that will neither leak in ordinary service nor break down under unusually high pressure. With most types of joints the factors of safety and efficiency fall much below 100 per cent, despite the care and skill expended by expert splicers. By a new method the joint is made as perfect as the main body of the conductor, but is also stronger than the cable.

The following is a brief description of the process evolved by the Pirelli General Cable Works, Ltd., Southampton, England, and Pirelli, Milan, Italy:

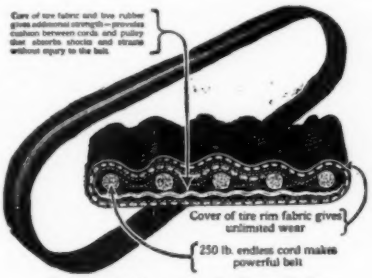
The process of making the joint consists in first splicing and soldering the copper conductors in the usual way and with sweating sockets, and then taking a roll of impregnated paper and so twirling over the united ends of a core that it becomes a solid paper tube which will not unroll even if the pressure used to tighten it be removed, and all the air and superfluous oil are squeezed out in the winding. There is no difficulty in applying the paper tube, provided the core be first served with hot oil and the coil of paper (supplied in a sealed container) be heated immediately before using. The three separately treated joints are then squeezed together and held in position with a narrow binding of similar paper, and the cable is further insulated and finished with taping, compound, and lead sleeve or casing.

"CRUDE RUBBER AND COMPOUNDING INGREDIENTS" should be in the library of every progressive rubber man.

New Goods and Specialties

Fan Belt with Stretch and "Come Back"

THE "White Stripe Cord" fan belt has been on the market long enough to have proved the claims of its manufacturers that it will stand up under the most strenuous service conditions. The outside wrapping of the belt is tire bead fabric, specially designed to resist friction and wear. Inside the cover is a strip of tire bead fabric around which an endless cord is wound five times and then the whole is covered with a layer of pure gum rubber. Into this soft cushion of rubber the cords sink when they are subjected to strain. Rubber insulation is used throughout and there is no possibility of the cords cutting one another. These belts are made in a variety of sizes and models to fit various types of cars, two groupings being especially for Fords.—Advance Automobile Accessories Corporation, 1721 Prairie avenue, Chicago, Illinois.


Cure of tire fabric and live rubber gives additional strength—provides cushion between cords and pulley that absorbs shocks and strains without injury to the belt.
Cover of tire rim fabric gives unlimited wear
250 lb. endless cord makes powerful belt

White Stripe Cord Fan Belt

Two Attractive Bathing Cap Models

With the approach of the summer vacation period the bathing cap displays come to the front in window decoration. Two very attractive designs shown herewith are typical of the way in which

Nopinseal Caps Nos. 247 and 267

serviceability is combined with vivid coloring and effective style features.—Nopinseal Rubber Manufacturing Co., 19-23 West 18th street, New York, N. Y.

"Live Leather" Garters

The manufacture of the "Live Leather" belt has recently introduced three styles of garters of similar construction, rubber within an outer casing of soft, comfortable leather, and termed respectively the "Knight-O-Garter," with one tab; the "Knight-O" golf garter, which buckles around the leg; and the "Knight-O" double grip garter, which has two tabs. These garters are now on sale at leading department stores in Greater New York.—Live Leather Belt Co., 1270 Broadway, New York, N. Y.

A Cigarette Convenience for Automobiles

A cigarette container mounted on the dash supplies the driver of a car with a lighted cigarette in just two simple movements. It is being marketed under the trade name of "Cig-a-lite" and holds 15 cigarettes of standard size. The front is of glass so that one can keep tabs on the supply. A pull on a lever releases a cigarette and at the same time heats a resistance coil, thus furnishing the light. The "puff" is obtained by means of a length of rubber tubing connecting with the intake manifold.—Splitdorf Electrical Co., 98 Warren street, Newark, New Jersey.

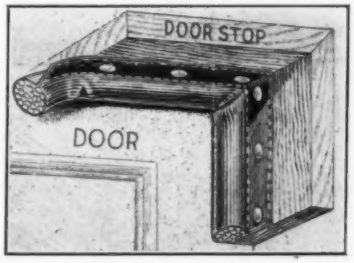
Kleinert Reducing Garments

The popular fancy to "look thin while getting thin" is catered to in the reducing garments illustrated. The hip reducer is not a corset but may be worn in conjunction with a corset if desired. It is worn next to the skin, causing a gentle pressure on the underlying tissue and inducing perspiration by excluding the air. It is claimed that these garments worn not less than three hours a day will accomplish a reduction of three to six inches in less than two months. The garments are made of pure rubber and it is claimed that with proper care they will last a long time, though the manufacturers candidly state that after the wearer has been reduced sufficiently the garments should be destroyed, as they cannot be put away and kept for future use. Specific directions for the use and care of the garments accompany them.—I. B. Kleinert Rubber Co., 485 Fifth Avenue, New York, N. Y.

Miracle Hip Reducer and Brassiere

Weatherstrip of Rubber-Coated Fabric

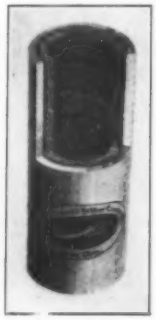
The "Home Comfort" patented insulated airseal cushion weatherstrip is made of rubber-coated fabric stitched over a number of strands of soft twine or similar material. It is therefore flexible and may be bent around corners without waste, cutting, or mitering. It comes in continuous lengths of from 50 to 500 feet, and no wood, metal or zinc binding is necessary, making it really insulated. It can be applied to any door or window and may be removed and used over again. It may be had in white but the standard color is maroon.—E. J. Wirfs, 106 South 17th street, St. Louis, Missouri.



Compressible Waterproof Cushion Gasket

Cutless Rubber Bearing

How to lubricate bearings simply, inexpensively and continuously, and how to secure a bearing that will not cut or score on the rod when used in a pump handling water containing grit is solved by the special rubber bearing here illustrated.



Cutless Bearing

The inner surface of the "Cutless" Bearing is a rubber compound known as "Olivite," which resists wear with much greater durability than metal. In this surface is molded a helical groove to carry water for lubrication and cooling. Solid particles roll across into this groove and are flushed away. "Cutless" bearings have been used in water containing 25 per cent of sand, without scoring either journal or bearing surfaces. Another surprising characteristic of Olivite rubber is that its coefficient of friction under water lubrication is lower than that of an oiled babbitted surface.—The B. F. Goodrich Co., Akron, Ohio.

Rubber Bushings in Radio Loud Speakers

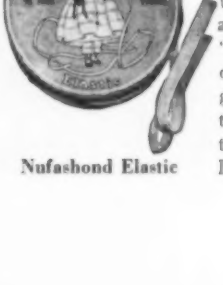
The "Amplion" loud speaker for use in radio receiving is equipped with one rubber bushing insulating the wooden horn from the metal sound conduit and another bushing insulating the sound conduit from the reproducer. The loud speaker itself thus combines the good qualities of the wooden horn with the metal sound conduit without producing unpleasant vibrations. It is beautifully finished and the nickel-plated adjustable base permits the mouth of the horn to be raised or lowered to project the sound in any direction desired. The Signal Electric Manufacturing Co., Menominee, Michigan, is the distributer of this product in the United States.—Alfred Graham & Co., London, England.

"Amplion" AR-19

"Buckroid" Rubber Mats and Matting

"Buckroid" is a very tough form of pure vulcanized rubber, without cloth filling or backing, and carries the manufacturer's guarantee to give 50 per cent more than ordinary wear and 100 per cent satisfaction. The colors are gray and chocolate and the popular prices make these products a profitable line for retailers. Stair treads, extra heavy in construction and attractive in pattern, are guaranteed to give ten years of service in the home. Door mats and landing pads, plain, perforated, or lettered, which the manufacturers say will not scruff up or bulge, may be had in combinations of gray, chocolate and green.—Buckeye Rubber Manufacturing Co., Willoughby, Ohio.

Narrow Elastic Fabric in Reels

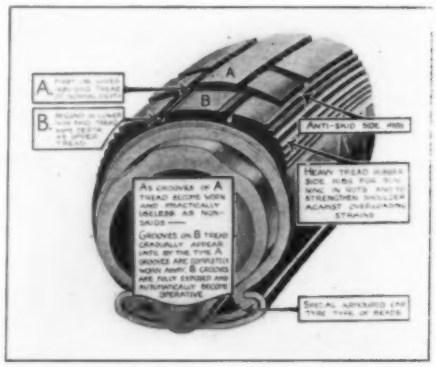


Nufashond Elastic

Dealers in notions and small wares are being sold to the idea of buying elastic fabric in strips of 12 yards or more so that a customer may purchase as much or as little as is needed without remnants. "Nufashond" elastic is of the very best quality, the rubber threads being of pure gum, so that there is a maximum stretch, the designs of the fabric being up to the minute.—The Narrow Fabric Co., Reading, Pennsylvania.

A New British "Comfort" Tire

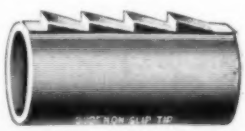
The Rapson cord tire, which consists of a cord cover of special design and a molded "deflector" tube of unusual section, is guaranteed against puncture or burst and to cover a minimum mileage of 6,000 for the single tread and 10,000 for the double tread. The single tread carries an extra heavy tough black tread of non-skid design extending well around the casing, which is multi-ply cord construction with pure rubber insulation between the plies. Incorporated in the tread and lying level with the bottom and slightly to one side of the circumferential tread grooves is a second set of grooves, temporarily filled with non-adherent rubber strips. When the original non-skid tread is worn down, this non-adherent material is laid bare and becomes detached from the tire, making a 3-rib tread which will last the remainder of the life of the tire.—Rapson Tire & Jack Co., Ltd., 477 Oxford street, London, W. 1, England.



Section of the Rapson Single Tread

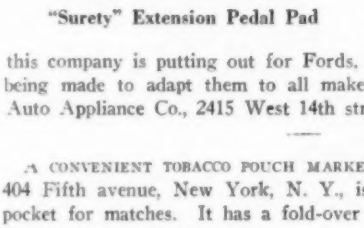
Rubber Attachment for Clothes Hangers

A recent addition to small wares of rubber is a section of tubing with notched projections as shown in the illustration, which slips over the ends of any clothes hanger and not only prevents the garments from slipping off but makes it possible for several garments to be hung on the same hanger. Another style than the one illustrated is called the "Fairy" and has the hook covered with rubber tubing and provided with small rubber buttons to receive loops on the garments.—The All-Styles Hanger Co., 303 Fifth avenue, New York, N. Y.



Non-Slip Clothes Hanger Attachment

Rubber Pedal Pads for Ford Cars



"Surety" Extension Pedal Pad

The "Surety" extension pedal pad is made especially for Ford cars and it has proved such a large seller that the manufacturers are expecting the 1924 production to run up to a million. This is only one of four different types which this company is putting out for Fords, and in addition plans are being made to adapt them to all makes of automobiles.—Grant Auto Appliance Co., 2415 West 14th street, Chicago, Illinois.

A CONVENIENT TOBACCO POUCH MARKETED BY MARK CROSS CO., 404 Fifth avenue, New York, N. Y., is rubber lined and has a pocket for matches. It has a fold-over flap which fastens down securely with a snap fastener.

"Cutlerite" Composition Soling

Soles of this composition are especially adaptable for heavy duty. The manufacturers claim that it will outwear leather and withstand the rough usage of everyday wear to which growing boys' shoes, for instance, are subjected. The material is to be had in both

Molded Sole of Cutlerite

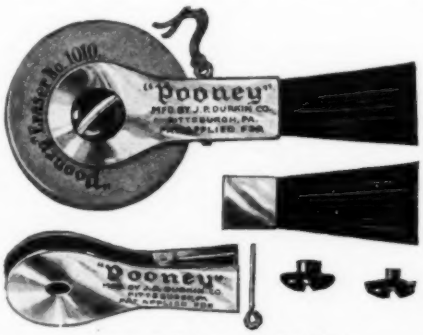
plain and sport styles as well as in sheets 12½ by 25 inches for use in repair work.—Alfred Hale Rubber Co., Atlantic, Massachusetts.

Tissue Rubber Casing for Sanitary Pads

A special formula is used in the preparation of the tissue rubber for the cover of the "Parapad" sanitary napkin, which results in a silky texture agreeable to the touch and so light in weight that it dries almost immediately when dipped in soap and water for cleansing. The casing can be used many times by simply inserting the refill at the center and drawing its ends through the ends of the casing. The parapad is retailed in individual glassine envelopes or two parapads in a box with a dozen or half-dozen fillers. —The Parapad Co., Inc., 37th street, at 14th avenue, Brooklyn, N. Y.

An Eraser Accessory

The tendency of the so-called brush erasers to wear out the eraser part while the brush is still good has resulted in a new patent called the "Pooney." The ordinary circular typewriter eraser is used with this device and the adjustment is made by means of a coin to fasten the central holding screw into place through the holes of the holder and the center of the eraser. At one side of the holder is an eyelet for a cord for tying to the typewriter. The "Pooney" eraser holder comes packed in a box with six extra erasers.—J. P. Durkin Co., 339 Fifth avenue, Pittsburgh, Pennsylvania.



"Pooney" Eraser and Its Parts

Non-Slip Rubber Drinking Glass Holder

At the British Empire Exhibition held recently at the Palace of Engineering, Bromley, Kent, England, one rubber device exhibited was a patented rubber ring having four legs, evenly spaced and offset against one another. The ring is of a size to fit any ordinary drinking glass and the legs cling to the table or table cloth and prevent the glass from sliding even though the table be tilted to an angle of 45 degrees. It is designed especially for use on yachts or on shipboard.—Burton's Patents, Ltd., Bromley,

Rubber-Tired Hobby Horse Velocipede

"Dandy Dobbin," the hobby horse vehicle illustrated, is the funny speedster around which Arthur Hammerstein's musical comedy "Mary Jane McKane" is written. On May 11 the members of the company at the Imperial Theater raced up Fifth avenue, New York City, on Dandy Dobbins, amusing the crowds and showing incidentally that the toy has strength as well as speed. The arrangement of the wheels is like that of a velocipede reversed, the large wheel being at the back and the two small wheels in front, and the motion is a real gallop. One-inch clincher tires, rubber handle bar grips, and rubber pedal treads are provided.—Eastern Enterprise Syndicate, Inc., 730 Fifth avenue, New York, N. Y.

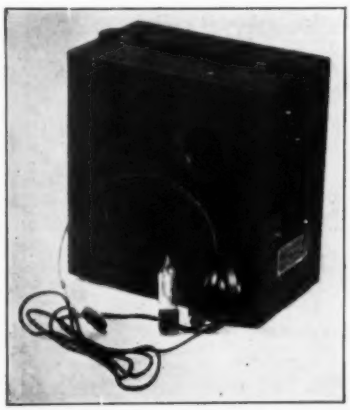
"Dandy Dobbin"

Lenk "Midget" Blow Torch

A small blow torch intended for use in radio work and other places where small amounts of soldering are to be done has a length of rubber tubing attached, one end of which is placed in the mouth of the user.—Lenk Manufacturing Co., Boston, Massachusetts.

Vacuum Tube Sound Amplifier for the Deaf

The "Vactuphone" is a vacuum tube device by means of which sound waves are so greatly amplified that normal ears can hear undreamed-of sounds, it is said, and subnormal ears can hear without effort ordinary sounds and conversations. It looks like a little camera with a tiny receiver attached. The rubber parts are the receiver, which is of hard rubber, the hard rubber cases in which the transmitters are mounted, and the rubber cushions used in mounting the vacuum tube for the purpose of absorbing shocks. Hard rubber is also used in the construction of the sound control device. It is said that one unit of electrical energy is increased ten times by means of the vacuum tube amplifier, and if this is compounded by passing the current through six tubes successively the original sound is amplified a million times.—Globe Phone Manufacturing Co., Reading, Massachusetts.



The "Vactuphone" Hearing Device

ENGRAVERS AND LITHOGRAPHERS AS WELL AS ARTISTS ARE FINDING a rubber cement known as "Best-Test" particularly adapted to their needs. It is being marketed by the Union Rubber and Asbestos Co., 1133 Broadway, New York, N.Y.

Activities of the Rubber Association of America

Tire Adjustment Conference

AN ADJUSTMENT conference was held under the auspices of the Service Managers' Committee at the Hotel Hollenden, Cleveland, Ohio, on May 6. Forty-one tire companies were represented at the conference, which lasted the entire day, the total attendance being about 60 persons. W. H. Sorn, Goodyear Tire & Rubber Co., chairman of the Committee, presided.

Informal addresses were made by A. L. Viles, general manager of the Association, and W. W. Duncan of the Hood Rubber Co., chairman of the Tire Manufacturers' Division. E. P. Weckesser of the Miller Rubber Co. spoke on the subject "Analysis of New Ninety-Day Warranty," while H. M. Bacon of The B. F. Goodrich Co. explained the mechanics of operating the new warranty, particularly with respect to checking the 90 days and the enlisting of dealers' support. "Verification of Complaints and Rumors of Deviation from Warranty" was the subject of a discussion by R. R. Drake of the United States Tire Co.

Representatives of the different tire companies discussed the points raised by the speakers and it is felt that this conference has accomplished much toward successfully launching the revised Standard Tire Warranty and to insure proper interpretation and application of it.

Fabric Division Meeting

The Automobile Fabric Manufacturers' Division held its regular quarterly meeting at the Yale Club, New York, N. Y., on May 12, when routine matters were discussed.

Inventory of Tire Dealers' Stocks

Responses to the questionnaires sent to tire dealers by the Rubber Association indicate that there are 122,000 tire dealers in the United States.

Of the 17,797 replies, 56.2 per cent of the dealers reported an inventory of less than 50 casings; 23.5 per cent between 50 and 100 casings; 11.8 per cent between 100 and 200 casings; 3.7 per cent between 200 and 300 casings; 1.6 per cent between 300 and 400 casings; 2.4 per cent between 400 and 1,000 casings; and .8 per cent over 1,000 casings. The total inventories reported by these dealers was as follows: Casings, 1,648,993; tubes, 2,388,796; solids, 44,513; cushions, 11,036.

Considering the replies representative of the industry, the Association built up on this basis the estimated total tire inventory of the country to a 100 per cent figure, the results being: Casings, 11,355,428; tubes, 16,498,602; solids, 306,347; cushions, 75,773.

Statistics Compiled from 1924 Questionnaire Covering the First Quarter of 1924[1]

RECLAIM AND SCRAP	Reported by Manufacturers Who Also Reclaim	Reported by Reclaimers Solely	Total
Number of tons reclaimed rubber produced from raw and cured scrap	8,175	13,661	21,836
Number of tons scrap rubber (including raw and cured scrap) consumed in production of reclaimed rubber	11,454	16,588	28,042

NUMBER OF TONS OF CRUDE RUBBER CONSUMED IN THE MANUFACTURE OF RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS OF MANUFACTURED RUBBER PRODUCTS

PRODUCT	Number of Tons of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries:		
Automobile and motor truck pneumatic casings	44,483	$104,781,000
Automobile and motor truck pneumatic tubes	11,438	18,026,000
Motorcycle tires (casings and tubes)	97	378,000
Bicycle tires (single tubes, casings and tubes)	230	854,000
All other pneumatic casings and tubes not elsewhere specified	.....	44,000
Solid tires for motor vehicles	3,928	6,450,000
All other solid tires	64	149,000
Tire sundries and repair materials	680	2,970,000
Totals	60,920	$133,652,000
Other Rubber Products:		
Mechanical rubber goods	4,085	$22,406,000
Boots and shoes	3,930	23,197,000
Insulating wire and insulating compounds	717	7,705,000
Druggists' sundries, medical and surgical rubber goods	604	3,144,000
Waterproof cloth, clothing and rubber sheeting	831	5,739,000
Hard rubber goods	943	3,209,000
Heels and soles	1,337	4,859,000
Miscellaneous, not included in any of above items	1,481	4,546,000
Totals	13,928	$74,805,000
Grand Total—All products	74,848	$208,457,000

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

	Pneumatic Casings				Inner Tubes				Solid and Cushion Tires			
1922	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
Twelve months, 1922	..	58,401,086	30,698,139	29,221,899	..	72,463,938	38,137,181	36,656,435	..	2,320,650	786,603	688,845
Twelve months 1923	..	67,448,419	33,933,936	32,991,810	..	87,867,770	45,128,083	43,554,963	..	3,013,674	692,148	690,090
1923												
March	58	5,670,601	3,865,726	3,322,637	57	7,740,945	4,375,414	3,828,315	11	265,843	79,788	77,144
April	56	6,088,272	3,539,326	2,976,160	55	8,394,184	4,259,558	3,535,635	10	260,631	71,468	72,609
May	57	6,906,694	3,659,986	2,757,764	57	9,292,223	4,317,537	3,414,115	10	268,323	77,288	67,147
June	55	7,040,600	2,956,943	2,502,185	54	8,924,326	3,590,011	3,581,060	10	283,425	72,445	52,126
July	54	6,471,124	1,992,989	2,539,425	52	7,527,281	2,666,354	3,942,247	10	263,891	42,345	45,219
August	58	6,058,387	2,355,915	2,807,432	53	6,950,578	3,577,922	4,304,034	10	262,810	48,141	45,925
September	60	5,397,557	2,029,581	2,623,775	55	6,457,455	3,254,575	3,683,574	10	249,379	37,074	45,971
October	59	4,876,352	2,361,340	2,819,583	55	6,898,425	3,855,244	3,595,737	10	234,945	37,285	48,065
November	55	4,689,329	2,399,725	2,456,296	53	6,693,639	3,451,716	3,422,426	11	213,686	32,577	49,471
December	56	4,329,300	2,437,148	2,603,617	52	6,318,446	3,288,665	3,497,472	10	178,088	34,937	62,408
1924												
January	56	4,808,084	3,220,292	2,785,335	51	6,720,247	3,887,959	3,475,713	10	182,782	53,604	43,375
February	55	5,265,133	3,278,674	*2,801,000	50	7,339,307	4,067,631	3,329,504	10	188,519	60,646	49,370
March	57	5,763,084	3,427,692	2,902,274	53	8,157,704	4,218,950	3,420,723	10	203,608	68,662	57,847

*Revised

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis or abroad.

(*Compiled by The Rubber Association of America, Inc.*)

INVENTORY OF CRUDE RUBBER IN THE UNITED STATES AND AFLOAT FOR UNITED STATES PORTS, MARCH 31, 1924

On Hand	Plantation (Long Tons)	Pará (Long Tons)	All Other (Long Tons)
Manufacturers	45,795	4,207	724
Importers and dealers	17,370	667	184
Totals	63,165	4,874	908

Grand total—On hand, 68,947

Afloat	Plantation (Long Tons)	Pará (Long Tons)	All Other (Long Tons)
Manufacturers	10,440	.....	.....
Importers and dealers	29,920	361	182
Totals	40,360	361	182

Grand total—Afloat, 40,903

[1]Number of rubber manufacturers that reported data was 231, crude rubber importers and dealers, 47, reclaimers (solely), 7; total daily average number of employes on basis of third week of March, 1924, was 142,506.

It is estimated that the crude rubber consumption figures are 90 per cent of the total and the crude rubber inventory figures 95 per cent of the total for the entire industry.

Costs of Planting Rubber Estate

An interesting estimate in connection with the cost of planting and bringing into bearing a rubber estate in Sumatra has been published in the *India-Rubber Journal*.

The estate in question is supposedly one of 2,000 acres, this being considered the minimum area for economical working. Forest land has been selected, at a price of £5 an acre. Preliminary expenses, such as forming the company, advertising, etc., are not included, the author's final summing-up being that about £100 eventual paid-up capital an acre would be needed for a planting-up proposition at the present day. It is believed that the figures as given below represent also with very fair accuracy the expenditure necessary for a similar proposition in Malaya.

First Year

Opening Expenditure		
Cost of leasehold land, 2,000 acres at £5	£10,000	
Recruiting and organizing labor force of 500 coolies at £10 per head	5,000	
Bungalows	2,500	
Coolie lines	2,500	
Sundry buildings	1,000	
Furniture	300	
Carts, live stock and/or mechanical transport	1,000	
Implements and tools	1,000	
		£23,300
Planting, Etc.		
Felling, heaping and burning, lining, holing and planting at £8 per acre	£16,000	
Changkolling and eradicating roots and stumps at £10 per acre	20,000	
Establishing nurseries	1,000	
		£37,000
Upkeep		
Weeding at £1 10 s. per acre	£ 3,000	
Supplying at 10 s. per acre	1,000	
Roads, bridges and drains at 10 s. per acre	1,000	
General cultivation at 10 s. per acre	1,000	
Diseases and pests	200	
Upkeep nurseries	200	
Implements and tools	200	
		£6,600
General Charges		
Salaries	£ 1,400	
Visiting agent and local agency	500	
Upkeep carts, live stock and transport	250	
Sundry goods and furniture, etc.	250	
Medical and sanitation expenditure	1,500	
Postages, telephone, telegrams, stationery	100	
Sundry expenditure	500	
Rent	300	
Insurance	100	
Head office and directorate	1,000	
		£5,900
First year's expenditure		£72,800

Second Year

General Charges		
As for first year plus £150 salary increases	£ 6,050	
Upkeep		
Weeding £2 per acre	£ 4,000	
Supplying 10 s. per acre	1,000	
General £1 per acre	2,000	
Roads, drains, etc., 10 s. per acre	1,000	
Diseases and pests	200	
Upkeep nursery	200	
Tools and implements	200	
Upkeep buildings	200	
		8,800
		£14,850

Third Year

General Charges		
As for second year plus £150 salary increases	£ 6,200	
Upkeep		
As for second year plus £50 extra for buildings upkeep	£ 8,850	
		£15,050

Fourth Year

General Charges		
As for third year plus £150 salary increases	£ 6,350	
Labor		
Re-engagement of 400 coolies at 8 s. per head, repatriation of 100 coolies at £3 per head, recruiting 100 coolies at £10 per head	£ 1,460	
Upkeep		
As for third year plus £50 extra for buildings upkeep and £50 extra for pests and diseases	£ 8,950	
		£16,760

Fifth Year

General Charges		
As for fourth year plus £150 salary increases	£ 6,500	
Upkeep		
As for fourth year plus £50 extra for buildings upkeep	£ 9,000	
Buildings		
Rubber factory and machinery, £6,000; smokehouse and drying shed, £500	£ 6.500	
		£22,000
Total expenditure in bearing		£141,460
Equals £70 14s. 7 d. per acre.		
Add		
Interest at 5 per cent on first year's expenditure of £72,800	£ 3,640	
Ditto 2 years' expenditure of £87,650	4,382	
Ditto 3 years' expenditure of £102,700	5,135	
Ditto 4 years' expenditure of £119,460	5,973	
Ditto 5 years' expenditure of £141,460	7,073	
		£26,204
Grand total		£167,664
Equals £83, 16s. 3d. per acre.		

PREDETERMINATION OF THE PROPERTIES OF VULCANIZED RUBBER[1]

The progress of vulcanization of a 2 per cent solution of rubber in benzene at 16 degrees-17 degrees C. after the addition of 3½ cc. of sulphur chloride to 100 cc. of solution can be conveniently measured by recording the load necessary to depress by 1 cm. a glass rod of 3 mm. diameter immersed vertically in the jelly to a depth of 4½ cm. The curves for different rubbers showing the relation between the period and the necessary load occupy different positions and never intersect. The relative position of these curves agrees within the experimental error with the relative values of the optimum tensile strength obtainable on direct vulcanization of the dry rubbers by immersion in a 3 per cent solution of sulphur chloride in benzene.

If the depression of the rod into the jelly is compared with the corresponding load without reference to time, the order in which the rubbers are placed by this characteristic agrees with that of the respective periods necessary for the occurrence of gelatin. This connection probably constitutes a correction factor to the relation between the solution-viscosity of various rubbers and their elastic properties after vulcanization.

Experiments on the load (applied gradually) necessary to cause a vertical rod to sink 1½ cm. from the surface downwards into similar jellies to those above gave curves which, with prolongation of the time, tended to approach a maximum; with one exception the values of these maxima for 14 rubbers fell in the same order as the optimum strength of the cold vulcanized rubbers. It is possible, therefore, to deduce the relative strength of dry rubbers after cold vulcanization from an examination of the jellies produced by the action of sulphur chloride on their solutions in benzene.

[1] M. Le Blanc and M. Kröger, *Kolloid-Zeitschrift*, December, 1923, 348-353.

The Obituary Record

Prominent Pacific Coast Rubber Goods Distributer

WILLIAM C. SMITH, president of the Wm. C. Smith Rubber Co., San Francisco, California, died suddenly of heart failure on March 27, aged 51 years.

Born at Oxford Ford, North Carolina, September 15, 1872, Mr. Smith went to the Pacific Coast at the age of seventeen years, locating at Spokane, Washington. In 1902 he entered the rubber business with the Washington Rubber Co., where he remained until July, 1910, at which time he formed the Wm. C. Smith Rubber Co., now operating warehouses at San Francisco and Los Angeles, California; Seattle and Spokane, Washington; Portland, Oregon, and Salt Lake City, Utah.

W. C. Smith

While with the Washington Rubber Co. he pioneered with automobile tires and tubes, introducing the products of the Diamond Rubber Co. Of late years he had specialized on garden hose, being one of the largest distributers of Goodrich products on the Coast. The business will be carried on by Mrs. Smith, who has long been an active partner and who is secretary and treasurer of the company.

Mr. Smith was a member of the Spokane Chamber of Commerce as well as of several clubs in that city, and was also a member of the Benevolent Protective Order of Elks, which took charge of the burial services at Spokane. Many personal and business friends learned with great regret of his sudden passing.

Export Representative of U. S. Rubber Co.

On May 1 Everard Thompson died suddenly at San Francisco of heart disease while waiting for the ship which was to take him to the Far East on special work for the United States Rubber Co. He had joined the organization in July, 1922, as special representative, and soon after joining the staff made an extended trip through South America for the purpose of reporting on industrial conditions as they related to his company.

Mr. Thompson was fifty-one years old at the time of his death. He will be well remembered at Yale University, where he was much interested in athletics and also in music. For a time he acted as associate editor of the Yale Alumni Weekly. He is survived by his widow.

Synthetic Rubber Chemist

Gabriel A. Bobrick, head of the Bobrick Chemical Co., 111 S. Garey street, Los Angeles, died recently at his home, 923 S. Burlington avenue. Mr. Bobrick had been a chemist for fifty years and was a firm believer in the feasibility of producing at low cost synthetic rubber on a large scale. His views on the subject were set forth in the May, 1923, issue of THE INDIA RUBBER WORLD.

Sales Manager Armstrong Rubber Co.

Ira A. Worthington, sales manager of the Armstrong Rubber Co., West Haven, Connecticut, was drowned May 12 in Long Island Sound.

Mr. Worthington was for several years prominent in the rubber industry of Trenton, New Jersey. Moving to Trenton from Massachusetts he was for a time general sales manager of the Delion Tire & Rubber Co., Trenton, New Jersey. Later he became one of the organizers of the Trent Rubber Co. and served as vice-president. When the latter concern went into the hands of a receiver Mr. Worthington went South and entered the employ of a rubber company. Later he was made sales manager of the Armstrong Rubber Co. The deceased was 40 years old and married. He made his home at Freeport, Long Island.

Salesman for Lambertville Rubber Co.

Wilbur H. Taylor, of Trenton, New Jersey, who was traveling in the South for the Lambertville Rubber Co., died on May 4 at Bluefields, West Virginia. He had been in ill-health for some time, and after being stricken was taken to a sanitarium.

Mr. Taylor was dean of the salesmen for the Lambertville concern, having traveled for about twenty years. His territory was in the mining districts of West Virginia and Pennsylvania. He also conducted a haberdashery in Trenton.

Death of Warren Y. Soper

Warren Y. Soper, president of Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ontario, Canada, died in Ottawa last month. An illustrated obituary will be published in our next issue.

U. S. EXPORTS OF RUBBER SHOES

United States exports to Switzerland of rubber shoes increased in 1923 more than fourfold in volume, as compared with 1922. The 1923 total is estimated at 183,212 pairs, as compared with only 44,093 pairs for the year previous. Favorable reports along this line from other countries are as follows: Japan, 161,903 pairs in 1923, as compared with 142,678 pairs in 1922; the United Kingdom, 117,288 pairs in 1923, as against 76,697 in 1922; the Philippine Islands, 53,688 pairs in 1923, and 39,377 pairs in 1922; Newfoundland and Labrador, 52,870 pairs in 1923, and 35,321 pairs in 1922; China, 47,678 pairs in 1923, as against 35,425 pairs in 1922. Denmark in 1923, and with a purchase of 64,136 pairs, almost equaled Norway, with 70,639 pairs. The latter country in 1922 had, with an importation of 98,239 pairs, ranked second among other nations of the world.

AMERICAN EXPORTS OF RUBBER BOOTS

The United Kingdom imported in 1923 more than double the amount of rubber boots purchased from the United States in the year previous, taking in 1923 133,178 pairs, and in 1922 only 52,199 pairs. Japan, which in 1922 with a purchase of 74,784 pairs had led all other nations, followed with a total in 1923 of 81,185 pairs. Newfoundland and Labrador with a purchase in 1923 of 48,254 pairs, ranked third in 1923 as in 1922, when their purchase had been 41,187 pairs. Canada remained fourth in 1923 as in 1922, taking in 1923 27,381 pairs, and in the year previous 20,491 pairs.

BRITISH MALAYA'S IMPORTS FROM JAPAN

The value of Japanese exports to British Malaya in 1923 amounted to £2,121,480, as compared with £2,117,144 in 1922. Of the twenty-one chief commodities imported from Japan in 1923, sixteen showed an increase, rubber tires being mentioned as valued in 1923 at £55,130, compared with similar purchases in 1922 estimated at only £38,058.

"PNEUMATIC TIRES," BY HENRY C. PEARSON. AN ENCYCLOPEDIA of tire manufacture, repair, rebuilding, machinery and processes.

News of the American Rubber Trade

Current Outlook in the Rubber Industry

ORIGINAL tire equipment for automobiles and tire replacement by motorists constitutes about 75 per cent of the American rubber industry; therefore it is essentially controlled by automobile production, which during the first quarter of this year totaled 972,025 cars, or 173,632 more than in the corresponding period of last year.

The public so far this season has not responded in buying activity, due to various causes, assumed or unexplained, hence, there is an over stock of cars and tires. Production of both is proceeding under pronounced curtailment. The larger tire manufacturers are operating at 75 to 80 per cent of ten-hour capacity.

Conservative estimates placed the total tire stocks in May at 18,000,000, of which 12,000,000 were in dealers' hands and 6,000,000 in those of tire manufacturers. This total represents five months' supply on the basis of 45,000,000 tires estimated as consumed last year.

This "cushion" is fully double that needed except in case of unusual demand. Production can proceed conservatively only as the excess cushion is absorbed.

Consolidations and organization readjustments, revision of manufacturing costs and reduction of inventories have been general since the first of the year. In consequence rubber companies are now operating on a more adequate margin than a year ago, particularly in tires. However, competition rules remarkably keen and profits are small in the industry. In some lines, notably tires, the industry has manufacturing facilities far in excess of demand.

Crude rubber and tire fabric markets are dull for lack of manufacturers' orders, which in these as in all other manufacturing supplies are limited severely to current needs. The Stevenson plan for rubber restriction has failed in the emergency for various reputed reasons but chiefly because economic laws cannot be continuously contravened by legislative enactment.

Financial

Canadian Consolidated Report

The financial statement of the Canadian Consolidated Rubber Co. Ltd., Montreal, Canada, presented at the annual meeting shows 1923 to have been more satisfactory than the previous two years. After preferred dividends, the surplus for the year amounted to $696,044, equal to 24.81 per cent on the $2,805,500 of common stock, which compares with a deficit of $781,876 in 1922 and a deficit of $1,935,495 in 1921.

Net sales for the period under review amounted to $14,590,433, as compared with $13,221,575 in the previous year. Expenses, which in 1923 included taxes and provision for contingencies, as well as cost of goods, selling and general expenses and provision for bad debts, amounted to $13,025,305, or about $64,000 less than in 1922. This left net income of $906,044, as compared with only $132,262 in 1922 and $90,336 in 1921.

After deducting bond and other interest, and after payment of the usual preferred dividend, the earnings on common stock, as stated above, were equal to 24.81 per cent, as compared with heavy deficits in the previous two years.

The balance sheet reveals the company to be in a very strong financial position. Current assets exceed current liabilities by $6,313,345, as compared with $6,038,048 in the previous year. Current assets at December 31, 1923, totaled nearly $7,000,000, while current liabilities were only slightly over $550,000, as compared with $1,082,114 in the previous year. Bills payable were reduced from $459,000 to $7,000, while loans payable of $105,000 were entirely eliminated. A new item of $652,480 loans receivable appears among current assets.

In the balance sheet the changes from the previous year are not striking. Plants and property show an increase of nearly $400,000 at $13,549,079. Depreciation reserve has been increased from $2,575,571 to $2,603,426, the latter amount including contingent reserves of $19,749. Profit and loss surplus now stands at $6,298,148, as against $5,602,103 in the previous year.

Annual Report of Hood Rubber Co.

According to the annual report of the Hood Rubber Co., Watertown, for the fiscal year ended March 31, 1924, total sales amounted to $28,248,653, compared with $28,180,007 in 1923, $25,239,603 in 1922, and $29,343,939 in 1921, which was the record. Net profits after preferred dividends indicate earnings of $6.90 a share on the 120,000 shares of no par value common stock, compared with $12.73 a share the preceding year. Current assets are $18,168,937 against current liabilities of $3,704,756.

The installation of many labor saving devices has enabled the firm to earn money on tires at present prices and increase efficiency in all departments. Some 7,000 employes are now producing more tonnage and dollars of output than were 8,000 employes a year ago.

New York Stock Exchange Quotations

May 22, 1924

	High	Low	Last
Ajax Rubber, com	5¼	4⅜	5¼
Fisk Rubber, com	6½	6⅜	6½
Fisk Rubber, 1st pfd	45	44⅞	45
Goodrich, B. F., Co., com	19½	19½	19½
Goodyear Tire & Rubber, pfd	43	43	43
Kelly-Springfield Tire, com	14⅜	13¼	13⅜
Keystone Tire & Rubber, com	1⅝	1⅝	1⅝
Lee Rubber & Tire, com	8⅞	8¾	8⅞
United States Rubber, com	24⅜	22½	24⅜
United States Rubber, 1st pfd. (8)	70	67¾	69⅞

Akron Rubber Stock Quotations

Quotations of May 20 supplied by App-Hillman Co., Akron, Ohio:

	Last Sale	Bid	Asked
American com.	5	...	10
American pfd.	50	...	35
Amazon com.	1¾	1½	2¼
Firestone com.	71½	71½	73
Firestone 6% pfd.	96	96	96½
Firestone 7% pfd.	90½	90½	91½
General com.	165	163½	185
General 7% pfd.	98	97	100
Goodrich 6½s	96¼	96	96½
Goodyear com.	10	9⅞	10⅛
Goodyear 7% pfd.	42½	42½	43½
Goodyear 1st mtg. 8s	116⅞	116¾	117¼
Goodyear deb. 8s	102¼	102	102½
India com.	75	73	77
India 7% pfd.	76	75	80
Mason com.	¾	¾	1¼
Mason 7% pfd.	14	13	16
Miller com.	65	65	68
Miller 8% pfd.	93	93	95
Mohawk com	6	6	9
Mohawk, pfd.	50	50	53
Rubber Products	10	10	...
Seiberling com.	3⅞	3⅜	4
Seiberling 8% pfd.	49½	47	50
Star com.	9	...	15
Star 8% pfd.	30	...	60

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Boston Woven Hose & Rubber Co.	Pfd.	$3.00	June 16	June 2
Boston Woven Hose & Rubber Co.	Com.	$1.50	June 16	June 2
Converse Rubber Shoe Co.	Pfd.	$3.50 s.a.	June 1	May 15
Firestone Tire & Rubber Co.	7% Pfd.	1¾% q.	May 15	May 1
General Tire & Rubber Co.	Com.	1½% q.	May 1	Apr. 19
Hood Rubber Co.	Com.	$1.00 q.	June 30	June 20
Hood Rubber Products Co.	Pfd.	1¾% q.	June 1	May 20
Miller Rubber Co.	Pfd.	2% q.	June 1	May 10

New Incorporations

Acme Rubber & Flooring Co., Inc., March 19 (Virginia), $2,500 paid with privilege to increase to $20,000. E. P. Moore, president; J. Irving Bear, secretary and treasurer, and A. G. Robertson. Principal office, 1900 West Broad street, Richmond, Virginia. Dealers and jobbers in rubber flooring, rubber mats, runners, etc.

Ajax Tire Co., of Denver, Colorado, The, April 19 (Delaware), $10,000, par value $100. Incorporators: E. E. Craig; A. L. Raughley and M. E. Scanlon, all of Dover, Delaware. Principal office, with the United States Corporation Co., Dover, Delaware. To deal in all kinds of rubber tires.

Ajax Tire Co., of Omaha, Nebraska, The, April 19 (Delaware), $10,000, par value $100. Incorporators: E. E. Craig; A. L. Raughley and M. E. Scanlon, all of Dover, Delaware. Principal office, with the United States Corporation Co., Dover, Delaware. To deal in all kinds of rubber tires.

Ajax Tire Co., of Charlotte, North Carolina, The, April 19 (Delaware), $10,000, par value $100. Incorporators: E. E. Craig; A. L. Raughley and M. E. Scanlon, all of Dover, Delaware. Principal office, with the United States Corporation Co., Dover, Delaware. To deal in all kinds of rubber tires.

Al's Tire Shop, Inc., May 13 (New York), $5,000. Incorporators: Eugene Stock and Elie Halperin, both of 120 Broadway, New York City, and Arthur Deutsch, 796 East 175th street, New York City. Principal office, Manhattan. To carry on an automobile tire and accessory business.

B. & M. Rubber Co., Inc., May 8 (Delaware), $250,000, par value $100. Incorporators: Henry E. Watkins, 1329 Inwood avenue, Bronx; Oscar R. Cassell, 2412 Seventh avenue and Rose Nerenstone Bookman, Mohawk Building, 160 Fifth avenue, all of New York City. Principal office, with the Corporation Trust Co., of Delaware, Dover, Delaware. To manufacture and deal in rubber goods of every description.

Beekman & Co., Limited, May 10 (New Jersey), $125,000. Incorporators: Eva May Williams, Hotel Majestic, New York City; Washington Wilson, Metuchen, and Anna Alice Caplin, 2705 Boardwalk, Atlantic City, both of New Jersey. To deal in, import and export rubber goods of every class and description. Principal office, 2705 Boardwalk, Atlantic City, New Jersey.

Bickel Tire & Supply Co., Inc., May 1 (New York), $10,000. Incorporators: Geo. J. Bickel, 23 Palmer avenue, Kenmore; W. P. Cochern, 78 Tioga street, and Geo. E. Wisch, 707 Morgan Building, both of Buffalo, and all of New York. Principal office, Buffalo, N. Y. To deal in tires and athletic goods.

Connecticut Rubber Co., The, April 21 (Delaware), 5,000 shares of preferred stock, par value $10.00, and 2,500 shares of common stock without nominal or par value. Incorporators: James J. Hoctor; John T. Mahoney, both of Fall River, and Maurice A. Long, Brockton, all of Massachusetts. Principal office, with the United States Corporation Co., 19-21 Dover Green, Dover, Delaware. To manufacture, buy, sell, and deal in rubber goods of every class and description.

Durable Balloon Tire Co., The, April 11 (Ohio), $1,000. G. E. Buckingham, Jr., president; G. W. Pancoast, vice-president, and S. E. Conner, secretary and treasurer. Principal office, 46 South Broadway, Akron, Ohio. To manufacture and sell Durable balloon cord tires.

Holbrook Tire & Rubber Co., Inc., May 10 (New Jersey), $125,000. Incorporators: Samuel Liebstein, 104 Parkhurst street; Samuel H. Berlin, 800 Broad street; Pauline D. Ferster, 43 Quitman street, and Nettie Rasnick, 800 Broad street, all of Newark, New Jersey. Principal office, 800 Broad street, Newark, New Jersey. To manufacture, buy, sell and deal in tires for automobiles, bicycles, carriages and other vehicles and to purchase and make other rubber goods.

Illinois Tire & Rubber Co., April 28 (Illinois), $50,000. Lewis J. De Holczer, president and general manager, 918 Oakdale avenue; Dr. Gustav F. Berger, vice-president and treasurer, 451 Oakdale avenue; Dr. Henry Baumbarth, secretary, 2144 Cleveland avenue; E. J. Moran 2088 No. Le Claire avenue, and J. A. Greely, 2649 Clybourn avenue, all of Chicago, Illinois. Principal office, 2649 Clybourn avenue, Chicago, Illinois. To manufacture and sell automobile tires, inner tubes and other rubber goods.

Latrobe-Lafferty Tire Co., Inc., May 6 (New York), $25,000. Incorporators: Chas. H. Latrobe, 17 Cleveland avenue; F. B. Lafferty, 41 Sterling avenue, and J. S. Coleman, 21 Cleveland avenue, all of Buffalo, New York. Principal office, Buffalo, New York. To distribute Kelly-Springfield tires.

Major Tire & Supply Co., January 25 (Illinois), $10,000. H. M. Eicholtz, president and treasurer; H. O. Johnson, vice-president and director; T. M. Whitson, secretary and director, John Platnicky, director, and Major L. McFall, director. Principal office, 2959 Armitage avenue, Chicago, Illinois. To carry on a business of vulcanizing and repair of tires and to buy and sell tires, accessories and supplies for automotive vehicles.

Mefford Tire & Supply Co., The, February 13 (Ohio), $15,000. E. L. Mefford, president and general manager; L. W. Baker, secretary, and C. R. Bollinger, treasurer. Principal office, 125-127-129 South Elizabeth street, Lima, Ohio. To deal in tires, automobile accessories and to do tire repairing.

Mid-West Rubber Mfg. Co., March 3 (Colorado), $300,000 of preferred and $50,000 of common stock. Chas. W. Clark, president and treasurer; E. M. Clark, vice-president, and A. S. McCormack, secretary. Principal office, Arvada, Colorado. To manufacture tires and tubes.

Minute Auto Rim Corp., The, April 18 (Delaware), $1,000,000, par value $5. Incorporators: Peter J. Walsh, 326 Eldert street; Frederick Leser, 340 Eldert street, both of Brooklyn, N. Y., and Frank E. McNally, 82 Beaver street, New York City. Principal office, with the Colonial Charter Co., 927 Market street, Wilmington, Delaware. To carry on a business of manufacturing and dealing in rims and wheels to be used on automobiles.

Multyplex Packing & Rubber Co., The, March 17 (Ohio), Theodore A. Meyers, president, 347 Batavia street; L. H. Sebastian, vice-president, 2713 Robinwood street; Wallace Tomey, secretary and treasurer, 18 Garfield Place; Ernest Pickering, Director, 430 Walden avenue, and James A. Lannen, office manager, Box 165 Glendale avenue, all of Toledo, Ohio. Principal office, 6 South St. Clair street, Toledo, Ohio. To manufacture and sell Meyers' Multyplex Packing and to handle all kinds of packing, belt, hose, pump valves, also a general line of mechanical rubber goods.

Non-Skid Airless Tire Co., Inc., May 13 (New York), $250,000. Incorporators: Otto Ribarsch, Marie Ribarsch, both of 4848 Broadway, and L. L. Clear, 644 W. 204th street, all of New York City. Principal office, Manhattan. To carry on a tire business.

Ohio-Indiana Rubber Corp., The, April 29 (Delaware), $2,600,000. Incorporators: M. M. Lucey; M. B. Keese and L. S. Dorsey, all of Wilmington, Delaware. Principal office, with the Colonial Charter Co., 927 Market street, Wilmington, Delaware. To carry on the business of planting and cultivating rubber trees.

Port Morris Truck Tire Corp., April 28 (New York), $20,000. Incorporators: Jos. Cancro, 2451 2nd Avenue; A. J. Dittmar, 407 E. 55th street, and Louis Cohen, 291 Broadway, all of New York City. Principal office, Bronx, New York City. To deal in tires, etc.

Provident Machine Co., The, March 12 (Delaware), 5,000 shares without nominal or par value. Incorporators: T. L. Croteau; M. A. Bruce, and A. M. Hooven, all of Wilmington, Delaware. Principal office, with the Corporation Trust Co. of America, DuPont Building, Wilmington, Delaware. To manufacture and deal in brake lining machines, brake shoes and automobile and motor car accessories.

Serber Rubber Co., Inc., The, April 24 (New York), $20,000. Incorporators: Simon Anhalt, 501 West 111th street; L. W. Stern, 616 West 184th street, both of New York City and N. M. Satloff, 174 Pulaski street, Brooklyn, N. Y. Principal office, Manhattan. To deal in tires.

Triple Airless Mfg. Co., The, April 7 (Delaware), $40,000, par value $100. Incorporators: M. M. Lucey; M. B. Lucey and L. S. Dorsey, all of Wilmington, Delaware. Principal office, with the Colonial Charter Co., 927 Market street, Wilmington, Delaware. To deal in automobile truck and other tires and accessories.

Ultimate Tire & Rubber Corp., May 10 (New York), $50,000, par value $10. Incorporators: Max S. Rebarber, 510 Claremont Parkway, Bronx; P. Catalano, and M. J. Orr, both of 1730 Broadway, and all of New York City. To deal in tires.

Willard Rubber Products Co., Inc., March 10 (California), $100,000. Cyrus Field Willard, president; S. Dalziel Reid, vice-president; Walter C. Harlow, chairman of the Board; Frank G. Webb, treasurer and general manager, and William B. Gross, secretary. Principal office, 1340 Kettner Boulevard, San Diego, California. To manufacture various rubber products and to devulcanize rubber in accordance with the patents issued and to be issued to Cyrus Field Willard, including mechanical goods and sundries.

PIONEER RUBBER FLOORING

The Pullman palace cars that were exhibited at the Columbian Exposition of 1892-3 were equipped with floors made by The Gutta Percha & Rubber Manufacturing Co., said to be the pioneer manufacturer of rubber floors in this country.

Rubber floors made at that time differed widely from the type now being manufactured by this company. The earlier, interlocking types of flooring were hard and brittle. While they offered color possibilities that existing floors did not give, they were no more comfortable than the ceramic or mosaic tile floors that have been used in the last decade.

Later came the period when sheet rubber floors were considered an advantage, but these were discarded because large calendered sheets were too elastic. Also, it was impractical to cement large sheets to the floor without air pockets, making repairs or replacements difficult and destroying the original beauty of the floor.

A new type of floor which has been developed promises to give perfect satisfaction to the architectural and contracting professions. However, rubber as a floor covering will be discredited unless it is laid after careful consideration of the service to which the floor is subjected. Many different types of rubber floors are now on the market, and it will be interesting to know by actual service in the next few years which floors answer the demand for a practical floor covering.

Unquestionably there are many difficulties in this industry. When a manufacturer considers flooring, he must look at the subject beyond the possibilities of tonnage and consider the expensive construction problems that constitute a greater part of the manufacturing cost than the actual plant production cost of rubber flooring.

NATIONAL TIRE DEALERS' STOCKS

According to statistics prepared by the National Tire Dealers' Association, there were on December 31, 1923, approximately 24,000,000 tires in the United States in the hands of 60,000 authorized dealers. Rubber manufacturers, however, and those who have prepared various trade lists differ as to these figures, estimating the number of dealers at from 120,000 to 180,000.

The Rubber Trade in the East and South

Manufactured Goods

Eastern rubber mills, in general, are doing business on rather close margins of profit, due to competition. The continued policy in general practice of ordering goods to meet immediate needs only has reduced factory operation to about 75 to 80 per cent of capacity in such lines as tires, automobile topping, footwear, and other staple lines. Factories running full are mostly those devoted to mechanical goods, sundries, specialties, heels, and seasonal sporting goods.

Plants manufacturing insulated wire are the only ones operating near peak production. A newly equipped insulated wire plant, one of the largest in the East, is now about ready for operation and will start on full time soon.

The rapidly increasing interest favoring rubber flooring has induced many manufacturers to undertake making it. Tonnage in this line will doubtless run high and stimulate the use of crude and reclaimed rubber.

Production of proofed goods is much under capacity and to that extent unsatisfactory. The same is true of automobile topping. In this line most mills are running at about two-thirds capacity, under customers' orders to defer shipments.

Footwear plants have not yet regained full schedule operation following the annual spring shutdown for repairs.

Considerable progress is being made by manufacturers of tire building equipment in changing and renewing in tire plants the machinery and molds needed for volume production of balloon tires. These tires bid fair to predominate over standard high pressure tires to the same or greater extent that straightside cords superseded clincher fabric tires.

New York

The partnership formerly existing under the firm name of William H. Stiles & Co., with offices at 44 Beaver street, New York, N. Y., has been recently dissolved. After June 1 the liquidation of the company's affairs will be carried on by William H. Stiles and Lynn D. Stiles, who have joined the organization known as Armand Schmoll, Inc., 41 Park Row, New York, N. Y., and will maintain a new department for the purchase and sale of crude rubber and kindred products.

The formation has been recently announced of the Robert Badenhop Corporation, 200 Broadway, New York, N. Y., which will carry forward the crude rubber business previously maintained at the above address by Robert Badenhop individually. The present personnel will be retained by the corporation and the character of the business remains unchanged.

The Beaney Rubber Co., Inc., 117-119 West 46th street, New York, N. Y., will continue the business formerly maintained by the Beaney Brothers and also the Beaney Flap Manufacturing Co. The new organization, which has a factory at Poughkeepsie, New York, now owns and controls all of the patents regarding a self-adjusting flap which were formerly owned and registered under the name of William R. Beaney. Officers of the new company are: Otto Braunwarth, president; H. G. Wellington, vice-president; William R. Beaney, treasurer; and Thomas A. Beaney, secretary.

The Meiseline Products Co., with main offices at 500 Fifth avenue, New York, N. Y., and a plant at Scranton, Pennsylvania, manufactures a chemical preparation to be known as "Meiseline," that is said to prevent punctures, and also to keep inner tubes elastic. Executives of the new organization include: Benjamin Steinfeld, general manager; Charles L. Meisels, production manager; and Joseph Schloss, secretary and treasurer.

The Smith Chemical & Color Co., specializing in dry colors, fillers and special chemicals for the rubber trade, has recently removed its offices from 257-9 Water street to 28 Moore street, New York, N. Y.

The Nestler Rubber Fusing Co., specializing in the production of tire molds for retreading and vulcanizing, has recently begun operations at 245 West 55th street, New York, N. Y. Emil Nestler, the inventor of the Nestler rubber fusing process, heads the organization.

New offices have been recently established at the Peck Building, Front and Pine streets, New York, N. Y., by Alan Northridge, who is specializing in fine colors and chemicals for the rubber industry.

The John A. McKee Co., formerly White & McKee, appraisers and cargo surveyors, recently moved their offices from 44 Whitehall street to 25 Beaver street, New York, N. Y.

Beginning June 1 Gordon Milne will open offices at 44 Beaver street, New York, N. Y., and will conduct business as a dealer and broker in crude rubber.

Carew & Billhardt, crude rubber brokers, have recently moved their offices to 25 Beaver street, New York, N. Y.

Sales offices of The McKone Tire & Rubber Co., Millersburg, Ohio, have been removed from the McCormick Building, Chicago, Illinois, to the Fisk Building, 250 West 57th street, New York, N. Y.

A. L. Wendover is manager of the New York City division as established by the Dunlop Tire & Rubber Co., Buffalo, New York. Mr. Wendover's offices are at 537 West 35th street.

Because of increasing business the Corning Rubber Co., Inc., moved its main offices on February 1 to the company's factory, at 266-270 Pearl street, Brooklyn, New York.

The Velveton Rubber Corporation has recently removed from 294 Ocean avenue, Jersey City, New Jersey, to its own new factory at 36-38 Hobson avenue, Laurel Hill, Long Island, New York. At the new location the most modern types of equipment have been installed in order to best serve the interests of the company's patrons.

The Bison Tire Co., 1006 Main street, Buffalo, New York, handles Dunlop truck tires as well as pneumatic casings and tubes. S. Waterfall, general manager, states that 90 per cent of the purchasers of the new tires prefer the balloon type, which will fit present rims.

Nine branches and four warehouses, exclusive of those attached to the first-mentioned establishments, are now being maintained in the United States by the Dunlop Tire & Rubber Co., Buffalo, New York. The nine branches are in the following cities: Atlanta, Chicago, Milwaukee, Cleveland, Philadelphia, Boston, Dallas, New York City, and Seattle. The four warehouses are located in Detroit, Columbus, Pittsburgh, and Indianapolis. Within a short time the Dunlop organization will also establish divisional headquarters in Kansas City, Missouri, and Minneapolis Minnesota, in order to better serve the territory in and surrounding those two cities.

There is a considerable demand for Firestone balloon tires in the city of Buffalo, New York, and vicinity, according to E. C. Thomas, branch manager in that city for the Firestone organization. Mr. Thomas believes that the balloon tire has come to stay, judging from the expressions of appreciation from the many users.

Leffler & Irr, dealing in automobile accessories at 1523 Main street, Buffalo, New York, also specialize in Hewitt tires. Excellent business since the first of the year is reported by this sales organization, which claims that the balloon tire has come to stay.

According to the Smith Tire Supply Co., 888 Main street, Buffalo, New York, the demand for balloon tires is steadily increasing. The Smith company handles Firestone casings.

Eastern and Southern Notes

The H. H. Allyn Rubber Corporation, Norwich, Connecticut, recently held a sales convention at Norwich and discussed future plans. The company manufactures the Allyn self-seal puncture-

proof inner tube, and is considering the production of balloon tubes, and possibly the tire itself. Executives of the organization include: H. H. Allyn, president and general manager; Charles P. Hill, secretary and treasurer; and O. A. Ryfle, director of sales.

H. W. Butterworth & Sons Co., Philadelphia, Pennsylvania, is now carrying forward operations at its recently acquired plant formerly occupied by the Greenville Iron Works, Inc., Greenville, South Carolina. The foundry at the new branch has been sublet to the Greenville Steel & Iron Works, which organization will, in addition to operating for themselves, also make castings for the Butterworth company.

The Philadelphia, Pennsylvania, branch established by the Dunlop Tire & Rubber Co., Buffalo, New York, is located at Thirty-second and Oxford streets, with F. H. Sawyer in charge.

The Wadlinger Tire Shop has been recently opened at 417 Croton avenue, New Castle, Pennsylvania, and is handling the better makes of tires. Norman J. Wadlinger heads the organization.

The Dorfman-McCormick Sales Co., 143 Jefferson avenue, Scranton, Pennsylvania, is now the agent in the above-mentioned city for tires manufactured by the Hood, Norwalk, and Kelly-Springfield organizations.

Both Goodrich and Fisk tires, of the interchangeable type as well as balloons for small diameter wheels, are being handled by the Dunham Tire Service Stores, 422 Peachtree street, Atlanta, Georgia. This company believes that the balloon tire will eventually supersede the cord tire, as the latter succeeded the fabric casing.

The newly elected officers of The Sure-Foot Heel & Rubber Co., Gettysburg, Pennsylvania, include the following: W. E. Pitts, president; H. T. Weaver, vice-president; E. M. Bender, secretary and treasurer; E. O. Cash, general manager; and J. T. Mahon, works manager. The directors are P. B. Rice and S. F. Snyder.

The Western Auto Supply Co., which maintains general offices at Kansas City, Missouri, as well as five branches in other cities, has recently opened another retail store and mail order department at 187 Peachtree street, Atlanta, Georgia. Satisfactory trade conditions are reported for the territory covered by this new establishment, which includes seven states: Florida, Georgia, Alabama, Mississippi, North and South Carolina, and Tennessee.

The Grow Tire Sales Co., 79 Walton street, Atlanta, Georgia, distributes the Grow cord and fabric tires, as well as other accessories throughout the southeastern states.

The McClaren Rubber Co., Charlotte, North Carolina, manufacturer of "Autocrat-Allroad" tires, has for some time been experimenting with balloon-type tires for present rims and wheels and the resultant casings now being produced are said to have met with immediate acceptance. The company is making arrangements to supply its distributers with larger quantities of such casings.

The Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, has opened a new branch at Raleigh, North Carolina, with J. W. Teachey, Jr., in charge. The branch will look after all the Globe business in North Carolina.

The Richmond Rubber Co., Inc., 32 North Seventh street, Richmond, Virginia, wholesale rubber goods dealer, is now handling a full line of rubber footwear, as manufactured by the Converse Rubber Shoe Co., Malden, Massachusetts. E. R. Patterson, president of the Richmond organization, was formerly connected with The B. F. Goodrich Co., later becoming assistant manager at the Philadelphia branch of the Diamond Rubber Co.

Carter & Cook, Richmond, Virginia, are now handling Michelin balloon tires. These "comfort cords" can be used on the present makes of cars without change of rims.

The Godfrey-Hindley Tire Co., 414 North Gay street, Knoxville, Tennessee, handles a complete line of the United States Rubber Company's tires and tubes, including pneumatic truck tires. In addition the first-mentioned organization is exclusive agent in Knoxville and Knox County for the products of the Miller Tire & Rubber Co.

Dayton, Goodrich, and Firestone tires are being handled by the recently organized Hager-Lee Tire Co., Seventh and Commerce streets, Nashville, Tennessee. Both Mr. Hager and Mr. Lee were formerly connected with The B. F. Goodrich Co.

The distribution of Mansfield tires and tubes throughout the southeastern territory is being handled by Keith, Simmons & Co., dealer in automobile accessories at Nashville, Tennessee.

Prosperous conditions are reported by the Friedman Tire & Rubber Co., 21st street and Avenue C, Birmingham, Alabama, distributer of Republic tires, tubes, and accessories. The Friedman establishment, now occupying a quarter of a block, has grown from small beginnings due to the energy and ability of a woman, Rhena Friedman, who is owner and general manager of the organization.

The McCormack Bros. Motor Car Co., Inc., Avenue C and 21st street, South, Birmingham, Alabama, reports a large volume of business in balloon tires, which apparently are giving complete satisfaction. The McCormack organization handles Firestone casings, both of the standard high pressure type and the balloon variety.

The Auto Tire and Battery Co., Bell and Catoma streets, Montgomery, Alabama, is handling Lee tires in that section of the state.

The Rubber Trade in New Jersey

Manufactured Goods

While New Jersey rubber manufacturers in general are busy, the general trend of the trade in some instances is not as brisk as might be for this season of the year. A slump in the manufacture of automobiles is given as a setback in the tire production at some of the plants. The majority of the midwest automobile concerns are not operating to maximum capacity, which holds back tire production. Overproduction of autos, together with the fact that the country is virtually flooded with second-hand cars of every description, is given as the reason for the slump.

Some of the Trenton rubber manufacturers find the demand for balloon casings larger than that of cord tires, while in other cases cords are reported in the lead. The output of mechanical goods continues good with new orders coming in. There has been an increase in orders for hard rubber goods for radio, and this is expected to keep the plants busy all summer.

Howe Receivership Denied

Vice-Chancellor Foster has denied a receiver for the Howe Rubber Corporation, New Brunswick, New Jersey, requested by a creditor of the company. The bill was not dismissed, but will be held pending further developments. The complainant charged the concern had suspended business for lack of funds, and that it had been improperly operated. John Tenney, Jr., president of the Howe company, said that operations had not been suspended for want of working capital, but only temporarily because the market for auto tires and tubes was overstocked. The selling organization was disposing of its manufactured stock, valued at $200,000, he said. Accounts receivable were being turned into cash and interest was being paid promptly on a note issue of $500,000, which is not due until 1932. The concern has a balance of $27,000 in the bank and no judgments against it. Invested capital amounted to $703,200, it was shown. Current assets were said to be $477,352.69 with liabilities of $211,821.70. Other assets, including real estate, equipment, etc., make a total of $569,412.72.

An advisory committee was appointed, and after a conference

with the board of directors a new management was placed in control.

Empire Receivership Continued

Judge Joseph L. Bodine's refusal to remove Arthur H. Wood as receiver of the Empire Tire & Rubber Corporation, Trenton, New Jersey, at the instance of the creditors' committee, is upheld by the United States Circuit Court of Appeals at Philadelphia, Pennsylvania. The opinion, written by Judge Schoonmaker, holds that the creditors' petition did not justify the relief sought. The creditors' committee contended that a preference had been shown White & Associates, Inc., Mr. Wood having failed to sue the concern for rubber contracted prior to the receivership.

For Judge Bodine to have authorized action against White & Associates, Inc., in compliance with the request of the creditors would, in the language of Judge Schoonmaker, "have been an unjustified expenditure of the funds in the hands of the receiver for the benefit of receivers." In sustaining Mr. Woods' conduct as receiver, costs of the litigation were assessed against the creditors' committee, and this decree of Judge Bodine is affirmed.

United Stores Co.'s Dinner

The United Stores Company, Trenton, New Jersey, on May 15 entertained at dinner at the Stacy-Trent Hotel about 350 automobile and accessory dealers of New Jersey and Pennsylvania. The concern, which is owned by Isaac Fineburg, Samuel Fineburg and Herman Fineburg, has its main office at Trenton with branches at Scranton and Pottsville, Pennsylvania, and at Camden, New Jersey.

The guests of honor included former Governor Edward C. Stokes, Dr. Charles A. Eaton, of Somerville; Major M. O. Kimberling, of the State Police, and Ray Sherman, of New York, N. Y., editor of "Motor," who gave an illustrated talk on "Ask 'Em to Buy." Edgar H. Wilson acted as toastmaster.

E. R. Rogers, of the Fineburg organization, arranged the dinner and prepared novel decorations. Splitdorf spark plugs were used as cigar lighters on the tables. In the reception room was a large display of Princeton tires and Tiger tubes and a full line of auto accessories and garage equipment. The guests were presented with novelty bags containing fifteen articles representing merchandise made by various manufacturers of auto accessories and electrical equipment.

Murray Company Busy

The Murray Rubber Co. states that "We are running 24 hours a day, three shifts. Output for the first three months of this year is 51 per cent greater than for the same period of 1923; sales are a trifle over one and three-quarter million; profits are more than three times those for the same period a year ago.

"We are making balloon tires in five sizes to fit present rims, and six sizes for 20 and 21-inch rims. Production on balloons has been small due to delay in securing equipment. We are now receiving new mold equipment and hope by the end of May to have a production of not less than 250 balloon tires per day."

Trenton Notes

The Trenton Tire Dealers' Association will hold a banquet and entertainment at Hillwood Lakes, Trenton, on June 4. An interesting program of amusement is being arranged and all the tire dealers of the city will be asked to attend. The association will hold no meetings during July and August.

The recently organized E. J. Scudder Foundry & Machine Co., with offices and works at Canal and Pearl streets, Trenton, is now engaged in the manufacture of wire and rubber machinery. In addition a line of general repair work for the rubber mills in the city of Trenton is being maintained. E. J. Scudder is president.

C. Edward Murray, Jr., president of the Murray Rubber Co., recently appeared before the City Commission of Trenton and asked for relief from the frequent freshets in the Assunpink Creek, which during the past few years have caused considerable damage to the Murray plant. The city promised Mr. Murray to take immediate action toward cleaning out the stream to prevent further damage.

John T. Spicer, general sales manager of the Thermoid Rubber Co., has resigned to take up other work. He had been connected with the Thermoid company for several years and was advanced to the position of general sales manager after starting as salesman. Mr. Spicer is one of the organizers of the Trenton Advertising Club, whose membership comprises nearly all the Trenton rubber manufacturers.

Whitehead Brothers Rubber Co., the oldest rubber concern in Trenton, reports conditions satisfactory. The company manufactures mechanical goods only and specializes in belting, packing and hose.

The Nearpara Rubber Co., manufacturers of reclaimed rubber, finds conditions much improved. Hyman A. Rosenthal, president of the company, says that business will pick up when crude rubber prices advance.

The Essex Rubber Co. continues busy, filling orders for heels and soles for various parts of the United States.

The Ajax Rubber Co. reports conditions much improved, with a large number of tire makers engaged. Seventy-five per cent of the production comprises balloon tires. William W. McMahon, general manager, recently returned from a trip to the "Automotive Belt" in the Midwest.

The Globe Rubber Tire Manufacturing Co. has increased its inner tube output 50 per cent, but is about five weeks behind in orders, with no stock on hand. The concern is making a special brand for other manufacturers. The Globe company is producing 800 tubes a day. The tire department is also busy. Milton Kohn has been appointed sales manager.

The report covering the receivership of the United & Globe Rubber Corporation from July 10, 1923, until February 21 of this year, by J. Philip Bird, one of the receivers, showed that the plant was operating under fairly good conditions. Henry J. Haigh, of Maplewood, New Jersey, one of the receivers, has resigned and Edward C. Rose, of Trenton, New Jersey, was appointed in his place. Messrs. Bird and Rose will continue as receivers.

The affairs of the David Lewis Tire Co., Trenton, New Jersey, and Allentown, Pennsylvania, have finally been adjusted. The concern filed a petition in bankruptcy in the United States District Court at Trenton some time ago, claiming liabilities of $155,224.32 and assets of $120,502.75.

New Jersey Notes

The Michelin Tire Co., Milltown, New Jersey, announces that balloon tires are coming into general use with hospital and police ambulances. "Ambulances travel at a high speed, often over rough roads or badly paved streets. Recovery of a patient often depends on the speed and care during removal to the hospital." The Michelin Company is making a survey of hospitals and ambulance equipment, and is recommending that tires on ambulances be replaced with Michelin balloon tires.

John Crowley, vice-president and general manager of the Servus Rubber Company, Rockford, Illinois, recently visited his brother, W. E. Crowley, factory superintendent of the Lambertville (N. J.) Rubber Co. About thirty years ago Mr. Crowley was an employe of the Lambertville company, where his father was assistant superintendent.

Albert J. Jemison and J. Raymond Cutter, officials of Jemison Brothers, dealers and distributers of Thermoid Rubber Co.'s products, have resigned from the company. Mr. Cutter has taken a position with the Eureka Rubber Co., while Mr. Jemison has

not decided what business to enter. Mr. Jemison is one of the founders of the firm, which will shortly be reorganized.

Davol Rubber Co. Celebrates Fiftieth Anniversary

From a modest beginning half a century ago to the position in 1924 of having the largest separate plant of its kind in the world is no light achievement in the highly competitive field of medical, surgical, dental and stationers' rubber goods manufacturing, and the Davol Rubber Co., of Providence, Rhode Island, may well be proud of its record of steady growth, quality products, progressive methods and business integrity.

This company was founded in 1874 by the late Joseph Davol, a pioneer in the rubber industry. In 1882 it was incorporated as the Davol Manufacturing Co. and in 1885 changed its name to the Davol Rubber Co. The business was established with the policy that its products would measure up to the highest standard of quality and this policy has been adhered to throughout the intervening years, accounting to a large extent for the continuing and increasing success which has marked the growth of the company. Davol products are now shipped into every country in the world.

Plant of the Davol Rubber Co., Providence, Rhode Island. Upper Insert, Joseph Davol. Lower Insert, Charles J. Davol

In keeping with this policy and as the demand for its goods increased, thus necessitating plant expansion, the company has spared no expense in developing its manufacturing facilities with the best and most efficient machinery, in adopting the most desirable methods and in gathering together an organization of carefully trained and highly skilled men and women. The present year witnesses the completion of another large building to be occupied within a few weeks.

Upon the death of Joseph Davol in 1909, his son, Charles Joseph Davol, was elected president and treasurer, and continuing in that capacity has directed the growth of the business to its present position of eminence.

The executive branch of the Davol Rubber Co. numbers employes who have splendid records for long service, among them being Charles B. Bamforth, secretary and acting treasurer, and P. R. Wesley, general manager, with thirty-one and twenty-six years to their credit, respectively. In the manufacturing department the production superintendent, Jesse Little, has been with the company for thirty-two years and there are twenty-five other employes, all members of the "Quarter-Century Club," who have continuous service records ranging from twenty-five to forty-five years. The company is exceedingly proud of this record of loyalty to service.

To foster cooperation between employes and management the company has exerted every effort to provide the best working conditions. The workers have their benefit association, their sport clubs and recreation room, and enjoy many other advantages attaching to their employment, such as free life insurance and the like. The policy of industrial relations has enabled the company to maintain a record clear of production disturbances that might otherwise have been caused by a less intelligent policy.

The Rubber Trade in Rhode Island

It is a long time since there has been so dull a period among the manufacturers of rubber goods in Rhode Island, especially those making footwear, as at the present time, with no prospects of any immediate improvement. In fact, the present indications are that there will be little if any activity among the footwear plants during the coming summer. This situation has been brought about through a combination of circumstances, principally weather conditions, while the concentration of tire manufacture in other places has lessened work in some of the local factories that for a number of years produced tires.

Notices were posted about the middle of the past month in the Alice Mill plant of the Woonsocket Rubber Co. at Woonsocket and the Millville plant of the same concern at Millville, to the effect that both plants will shut down June 27 and remain closed until August 4. It is believed that the business depression now being felt all over the country, together with the short winter, is responsible for the prospective shutdown. The suspension will be by departments, the last day's making will occur on June 27, and the departments will resume so as to allow the first day's making to take place on August 4. The exact dates affecting each department will be announced later. This shutdown will affect 1900 employes, 1400 of whom are on the rolls at the Alice Mill, Woonsocket, and the other 500 in the Millville plant.

Both plants of the Woonsocket Rubber Co. are said to be among the few subsidiary concerns of the United States Rubber Co. that have not been closed for indefinite periods during the past year. It had been hoped by the management of the Woonsocket Co. to keep both the Alice and Millville plants operating on full or at least part time schedules, but business conditions made it necessary to change the plans. Notices were posted earlier than is customary to prepare the employes for the shutdown.

At the National India Rubber Co., Bristol, another of the United States Rubber Co. subsidiaries, the shoe division has been operating on a reduced schedule for the past six months and many of the operatives temporarily dropped have secured employment elsewhere. The wire division is now working on a four-day week schedule, due to a continued slump in the industry. Although the National plant when running at capacity furnishes employment for upwards of 5,000, less than 3,000 hands are now employed.

The canvas shoe division at the National plant has been operating on a four-day schedule for over six months. Previously this concern furnished several thousand canvas shoes daily for export trade, but with the changing industrial conditions throughout the world much of this export business has been cut off, forcing a curtailment in production.

Radical changes are being made at the plant of the Atlantic Tubing Co., Knightsville, Rhode Island, necessitated by changes in the productions of the concern. The company has for several months been gradually shifting from flexible gas tubings to the production of rubber novelties, automobile accessories and other articles more in demand. Considerable new machinery and the alteration of equipment has been necessary to meet the changed conditions. Russell Hallowell has been on a trip in Canada where he joined his father-in-law, Harry F. Lippitt, president of the company.

Attempts having failed to effect a reorganization of the Walker Webbing Co., whose plants in Providence and Brockton, Massachusetts, were placed in the hands of Arthur Henius of this city and E. H. Small of Fall River as temporary receivers last November, the recommendation of the receivers to sell the holdings of the concern in this State was approved by Judge Barrows in the Superior Court for Providence County. Under the decree, if a satisfactory offer for the company's holdings in Rhode Island in one parcel at private sale is not received before May 21, steps will be taken to dispose of the property at public auction early in June.

The assets of the company were given at the hearing as $396,556, with liabilities amounting to $636,421 and current liabilities of the receivers of $10,368. Net profits of $3,391 for the period from November to May were shown, Mr. Henius declared.

The Cranston City Council has made an appropriation of $2,500 for the purchase of new fire hose and the City Council of Central Falls has appropriated $1,500 for a similar purpose.

Harold Amrhein, office manager of the Lawrence Felting Mill, Millville, Rhode Island, a subsidiary of the United States Rubber Co., narrowly escaped injury recently when his automobile collided with another machine. Mr. Hines, manager of the Philadelphia plant of the United States Rubber Co., and J. W. Winter, manager at Lawrence, Massachusetts, were with Mr. Amrhein in the car.

The C. A. Lapworth Webbing Co., West Bridgewater, Massachusetts, is planning to erect an additional mill of reinforced concrete for the manufacture of elastic webbing. Charles A. Lapworth is president of the company and William Lapworth, treasurer.

An appropriation of $700 has been made by the financial town meeting of Johnston, Rhode Island, for the purchase of 500 feet of fire hose. At the annual financial town meeting of Jamestown, Rhode Island, it was voted to purchase 600 feet of fire hose.

Charles K. Mullin, recently assistant foreman in the calender room at the National India Rubber Co., Bristol, has gone to Andover, Massachusetts.

John H. Wall, Bristol, has returned from Williamsburg, Pennsylvania, where he set up one of his rubber shoe dipping machines for a factory near Harrisburg, connected with the United States Rubber Co.

The Collyer Insulated Wire Works is erecting a one-story brick addition, 60 by 120 feet, to its plant on North Main street, Pawtucket, Rhode Island.

The Rubber Trade in Massachusetts

Manufactured Goods

The combination of poor weather and lack of confidence in the immediate outlook has prolonged the somewhat unsettled business conditions in New England, which are shared by the rubber industry. Some seasonal improvement has occurred during April and May, though reports not better than fair and satisfactory in most lines reflect the present hesitation that now exists. However, the fact that commercial bank deposits are increasing and commercial bank loans decreasing indicates a strong underlying financial situation.

The late rainy spring has delayed replacement tire sales considerably, and much mileage wear has been lost. On the other hand, rubber shoes and waterproof clothing have profited by it, Change overs to balloon tire equipment are providing a moderately increasing amount of new business. The usual seasonal expansion of building activity, especially residential construction, has had a good effect on the insulated wire branch of the trade. Automobile production is beginning to slow down somewhat and will similarly affect the automobile topping trade. Mechanical rubber goods are in only fair demand, the most active lines being those in seasonal demand. Rubber specialties such as toys, balloons, bathing caps, shoes, etc., are in seasonal heavy production. Footwear plants are operating four or five days a week on tennis lines the retail demand for which is late and delaying factory orders.

Boston Motor Bus Lines Increasing

Automobile bus lines for auxiliary service as feeders to trolley and steam railroads have in recent years become a big factor in transportation service in the Midwest and an important outlet for large quantities of pneumatic and solid tires. Bus service has already made a promising beginning in Massachusetts, especially in the outlying metropolitan district of Boston, and important extensions are likely at an early date.

Seven motor bus lines are now being operated by the Boston Elevated Railway, an average of 60,000 miles a month. Applications have been filed for four additional bus lines and there is demand for seven more lines which the trustees are considering in their plan of expansion, the longest being from Park Square to West Roxbury via the Fenway.

The lines now in operation have proved more efficient and economical than trolleys in outlying sections. Some objection to their extension into the heart of the city is being raised on the score of resultant increase in traffic congestion, already a serious problem in Boston.

Harvard Bridge Likely to Be Repaired

After lengthy consideration by various legislative committees and heated public controversy whether to strengthen and repair the well-known Harvard Bridge across the Charles between Boston and Cambridge at a cost of about $558,000 or to replace it by a new structure at an expense of some $4,000,000, the Massachusetts House of Representatives has unanimously passed a bill appropriating funds for the former plan and transferring the care of the bridge to the metropolitan district commission.

If this bill becomes law, as now seems likely, there is a fair possibility that rubber paving may be used for the floor covering, as suggested in THE INDIA RUBBER WORLD of April 1, 1923, provided the try-out of rubber paving recently installed on the Northern avenue bridge in Boston proves as favorable as its sponsors anticipate. With this in view Day Baker, chairman of the legislative committee of the Massachusetts Automobile Dealer and Garage Association, is continuing his active support of this project, in which he has taken a leading part from the outset. Should rubber paving be adopted Greater Boston would enjoy the distinction of having the first big installation of the latest thing in street paving in America.

Massachusetts Notes

The Boston salesroom of the Canfield Rubber Co., manufacturer of mechanical rubber goods and waterproof specialties, Bridgeport, Connecticut, is now located at 67 Chauncy street.

Among the new dealers in automobile tires of various makes is the Staniford Tire Co., 129 Staniford street.

Although the plant of the Fellsway Rubber Co., 30 Locust street, Medford, is for sale the factory has been in operation for several weeks past owing to the insistent demand from some of its customers for mechanical molded goods, rubber soles and heels.

Much constructive work of value in personnel management is being accomplished by the Forewomen's Council of Boston, in which the American Rubber Co. and Boston Rubber Shoe Co. are represented. At the fourth annual banquet, recently held at the Twentieth Century Club, Henry S. Dennison, president of the Dennison Manufacturing Co., gave the experiences of his firm with employment, education, employe representation and research, many of which are duplicated in the rubber industry where similar remedies are applicable.

Ernest Jacoby, broker in crude rubber and rubber substitutes, 79 Milk street, is now prepared to supply rubber latex and crêpe soling to the New England trade.

L. A. Laporte, formerly president and general manager of the Dunbar-Laporte Motor Co., has been recently appointed assistant general manager and sales director of the New England Tire & Rubber Co., Holyoke, Massachusetts.

Sports and athletics have long been an enjoyable feature of the employe life of the industrial establishments of Greater Boston, and rivalry between the teams of the various firms runs high. At the end of the basket ball season recently closed the team of the Boston Woven Hose & Rubber Co. emerged as champion of the Cambridge Industrial League. The teams of the Simplex Wire & Cable Co. and Gray & Davis, Inc., were tied for second place.

The belting department of the Boston Woven Hose & Rubber Co., Cambridge, recently made a record in turning out at short notice the huge conveyor belt shown in the accompanying illustration. It was built for the Cleveland branch of the American Steel & Wire Co. The order was for 500 feet, 36-inch 9 by 7-ply special conveyor belt 3/16-inch cover in the center, specifying 28-ounce duck. The order was received at 1 P. M. on Thursday and the belt was shipped at 10:15 A. M. on Saturday.

Coke Conveyor Belt Recently Made by the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts

E. T. Richardson is manager of the Boston division of the Dunlop Tire & Rubber Co., Buffalo, New York. His offices are at 200 Brookline avenue.

The Rubber Trade in Ohio

Manufactured Goods—Akron

Satisfactory profits have resulted from all operations in the Akron rubber industry thus far this year and while some decline in output is now being registered and will probably continue for several weeks, production will still remain on a profitable basis, according to official and semi official reports made available during the past two weeks.

The Goodyear Tire & Rubber Co. earnings are in the neighborhood of $1,000,000 according to reports. Firestone Tire & Rubber Co. earnings for the first half of the fiscal year closed April 30 are not known but are larger than during the corresponding period last year, during which $6,500,000 net was registered.

President B. G. Work of The B. F. Goodrich Co. reports that earnings have improved over last year. Miller Rubber Co. continues earnings of more than $25 a share on the common stock, while General Tire & Rubber Co. earnings are equal to last year when $120 a share on the "Old" common stock was shown. India Tire & Rubber earnings continue to be higher than dividend requirements and profits have enabled the Mohawk Rubber Co. to wipe out its entire bank indebtedness.

The middle of the month found some reductions in operations brought about by decline in demand for original equipment tires from the automobile producing companies. Large completed inventories also lead to curtailment but thus far the decreases in output have been brought about so gradually that scarcely a ripple has been created in the manufacturing situation of the industry. Balloon tire production continues to increase as rapidly as equipment is installed for their production which in turn is dependent upon deliveries from the equipment makers. No decline in the output of these need be expected this year.

In all other lines production remains practically the same as recorded a month ago. Mechanicals show some decline in some departments; hard rubber business continues to grow; the reclaiming business is characterized as normal, while the shoe and the druggists' sundries business are in seasonal lulls.

Firestone Tire Cut Denied

Firestone Tire & Rubber Co. is producing an unguaranteed fabric tire in 30 x 3½ sizes, intended to meet mail order house and other cut rate competition. The announcement was made by President Firestone when it was reported that the company had cut prices on this type and size of tires. It has been understood for some time that some of the larger companies were making tires without company names with which the "Gyp" competition was being met by the legitimate dealers. Firestone emphatically denied having reduced the price of tires and stated that no reduction was now being contemplated. The first report that prices had been reduced created a sensation in the rubber city because a tire price cut would unbalance present profitable production of tires.

Advertising Does Not Increase Tire Cost

While W. O. Rutherford, vice-president and sales director of The B. F. Goodrich Co., in a recent summary of possible reductions in costs of making and merchandising tires, included a possible reduction in advertising appropriations, President Harvey S. Firestone, of the Firestone Tire & Rubber Co., issued a statement during the past month that advertising cannot be considered as increasing costs of tires or other merchandise.

After pointing out that if small factories attempted to make tires without any stimulated demand the price would be prohibitive, Mr. Firestone said:

"If on the other hand we create a demand that enables us to manufacture thousands of tires and tubes daily we are then able to price those tires in direct reverse ratio to the quantity. The only way to increase production and decrease costs is to increase the market for goods, and the only economical way to do this is through advertising."

Britain Plans Further Rubber Restrictions

That new methods to protect rubber growers, following the virtual failure of the Stevenson plan, will be put into effect by the British Government was indicated in a speech by J. J. Broderick, commercial counsellor of the British Embassy before Akron rubber and business men. At the same meeting Sir Esme Howard, British Ambassador to the United States, delineated his experiences in the crude rubber field, which he said had resulted mostly in losses. Mr. Broderick indicated that a wide rubber survey is being made.

"As soon as estimates of the probable crude rubber demand for the next five or six years have been worked out, we will know what measures should be taken to protect the crude rubber growers.

"The soundness of the protection policy may be questioned but the ultimate aim cannot. Since the United States uses 75 per cent of the world's crude rubber supply it is evident that our interests are identical. The British Government will not permit growers to get beyond the bounds intended by the crude rubber restrictions —those of protecting the future supply of the material."

The British officials were entertained at the home of Harvey S. Firestone, president of the Firestone Tire & Rubber Co., who was directly responsible for the efforts made by the Department of Commerce to find new sources of raw rubber. Incidentally, the reports now being made as the result of the government rubber survey only confirm what has been published in THE INDIA RUBBER WORLD regarding rubber planting possibilities.

Financial Position Good Despite Reduced Profits

Statistics indicate that the cash position of the Akron rubber industry is such that no fears are entertained in case of business depression either temporary or over a comparatively long period; and also that the average profits of the industry as a whole have been considerably reduced during the past three years. At the end of 1923 the five large companies had cash and marketable securities amounting to $29,202,000 as compared with inventory amounting to $73,209,000. These figures compare with $36,000,000 in cash and $121,000,000 in inventory at the end of 1919, when the industry was about to enter the business depression. At the end of 1923 cash was 39 per cent of inventory while at the end of 1919 this item amounted to 29 per cent of inventory. At the end of 1922 cash amounted to $34,000,000 and inventory to $70,000,000, while the highest relation was reached at the end of 1921 when cash, $40,554,000 amounted to more than 51 per cent of inventory which at that time amounted to $78,830,000.

While the average net profits of the large rubber companies were approximately 12 per cent before charges on sales for a long term of years until 1920, this average has been reduced during the subsequent period, as the new figures show. During 1921, 1922 and 1923 the ten largest rubber companies in the United States showed an aggregate net profit of only $35,000,000. During 1921 these companies showed a net loss of $19,900,000, while the profits of the entire group in 1922 amounted to $28,706,000 and in 1923 to $28,075,000. The ten companies include the four large Akron companies, Fisk, Hood, Kelly-Springfield, Keystone, Lee and the United States rubber companies. Only four of these companies went through the three year period without suffering deficits in at least one of these years.

Miller Officers and Directors Reelected

At the recent annual meeting of the stockholders of the Miller Rubber Co., Akron, Ohio, all of the officers and directors were reelected, the officers including the following: Jacob Pfeiffer, president; C. T. Grant, vice-president; W. F. Pfeiffer, secretary, treasurer, and general manager; C. R. Wetsel, assistant secretary, and R. R. Jennings, assistant treasurer.

Directors include the first three executives named, and also F. B. Theiss, J. M. Doran, F. C. Millhoff, R. T. Griffiths, Charles A. Morris, William G. Dietz, and H. T. Holmes.

Akron Notes

More than 800 Firestone representatives attended a three-day convention of salesmen at Akron on May 13, during which President H. S. Firestone and Vice-President J. W. Thomas were the principal speakers. The visitors were moved from one large department of the plant to another on a special train operating on the Firestone interplant railroad. It was one of the largest gatherings of salesmen ever witnessed in the city.

C. W. McLaughlin, formerly with the Mohawk Rubber Co., reports that a new rubber company to be known as the Equitable Rubber Products Co. will be launched in the very near future and will specialize in the manufacture of hard rubber products. The company's financing is well under way, according to Mr. McLaughlin, and buildings are being inspected.

The Gregory Rubber Co. has made an assignment for the benefit of creditors. Assets are said to be $3,500, while the liabilities are not in excess of $5,000. The company specialized in the production of rubber toys.

Harry W. Howard, of Illinois College, Jacksonville, Illinois, and Lowell B. Cramer of Syracuse University, Syracuse, New York, have been awarded the rubber chemistry scholarships at the Municipal University of Akron, which are provided by the Firestone Tire & Rubber Co., and the Goodyear Tire & Rubber Co.

Equipment makers in the Akron district have been asked to bid on a new rubber tire factory to be built at Bedford, Virginia, which will have a capacity of approximately 600 fabric tires a day, according to information available here.

Firestone Tire & Rubber Co. during the month issued figures indicating that the annual cost of automobile operation in the United States amounts to approximately $8,000,000,000. In these figures depreciation is placed at $1,800,000,000; repairs and supplies at $1,000,000,000; gasoline at $825,000,000, and tires at $450,000,000. The company estimates the cost of new automobiles at $1,500,000,000 for 1921.

Hugh Allen, head of the publicity division of the Goodyear Tire & Rubber Co., has gone to Europe for several months, combining business and pleasure. The department announces that Hubert Maxon has been added to the aeronautical publicity staff.

The volume of business reported by the Lambert Tire & Rubber Co., Akron, Ohio, for the first three months of this year represents an increase of almost 100 per cent over a similar period for last year. Rapid developments are also apparent in this company's export trade, which shows a gain over last year of 125 per cent. The Lambert factory is at present being run at capacity, while plans for enlargement are being considered. G. M. Collette is general manager.

Dr. Charles M. Knight, professor emeritus of chemistry at the Municipal University of Akron, who introduced the study of rubber chemistry into the school, will be honored at a banquet which will be attended by more than 50 of his former students during the commencement week celebrations, according to plans now being perfected under the direction of Professor Hazzelton Simmons, head of the chemistry department. Dr. Knight has not been actively connected with the university for more than eight years.

Ohio Notes

W. W. Wuchter, formerly president of the Nebraska Tire & Rubber Co., Omaha, Nebraska, has recently become sales manager of the Studebaker-Wulff Rubber Co., Marion, Ohio. Mr. Wuchter will make his headquarters in Omaha, Nebraska, and will give particular attention to developing the sales territory west of the Mississippi. The company's 1924 sales are considerably in advance of those of the previous year, while daily production is now running from 750 to 1,000 tires, 1,500 inner tubes, and 1,500 trouser belts.

Howard Dingle has been recently elected vice-president, general manager, and a director of the Cleveland Worm & Gear Co.,

Payne avenue and East Fortieth street, Cleveland, Ohio. This company devotes its entire resources to the manufacture of worm gear drives and maintains thirteen branches in the leading cities of this country, as well as two similar establishments in Canada.

The Clyde E. Lowe Co., specializing in the construction and rebuilding of mandrels, has recently moved its general offices from the Fidelity Mortgage Building to the company's plant at 2976 East 81st street, Cleveland, Ohio.

The Triangle Tire & Rubber Co., Canton, Ohio, which has taken over the Canton plant formerly operated by the Gordon Tire & Rubber Co., is now manufacturing tires at the rate of 300 a day, with every indication of increasing production. Executives of the Triangle organization include: G. S. Shaeffer, president; John Schubach, vice-president; Raymond W. Kent, vice-president and general manager; C. A. Hanner, secretary, and John Quinn, treasurer.

The McKone Tire & Rubber Co., Millersburg, Ohio, has a capacity of 500 tires and tubes a day. Under the trade names of "McKone," "Wright," and "Madison," three brands of tires and tubes are being manufactured, these goods being marketed chiefly through distributers. Executives of the organization include the following: A. L. Gustin, president; O. S. Tweedy, vice-president and general manager; W. J. Rennick, secretary and treasurer; and G. C. Mechlin, superintendent.

Mason Tire & Rubber Co., Kent, announces April sales as $953,000 which is a 13 per cent increase over corresponding month last year. Profits, which are said to be small, show improvement, however.

T. W. Decker, Jr., is in charge of the branch maintained by the Dunlop Tire & Rubber Co., Buffalo, New York, at 2017 East Sixty-fifth street, Cleveland, Ohio.

The Rubber Trade in the Midwest

Allis-Chalmers Takes Over Worthington Division

All the records, patterns, patents, fixtures and manufactured stock formerly used by the Worthington Pump & Machinery Corporation in its crushing, cement, mining, and creosoting departments have been recently taken over by the Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin, the latter organization to continue the manufacture of such goods at its West Allis plant. It is stated that former users of Worthington machinery may feel assured of the continuation of adequate service, as superior facilities for production have been provided under the new management.

Midwestern Notes

An addition of approximately 25,000 square feet is being constructed at the Century Rubber Works, 54th avenue and 18th street, Chicago, Illinois. With increased facilities the organization will continue its manufacture of balloon and semi-balloon tires, while within the next three months another department will be added where approximately 1,000 tubes a day will be produced. C. J. Venn is president of the Century organization.

Louis F. Desmond is manager of the branch maintained at 3711 South Ashland avenue, Chicago, Illinois, by the Dunlop Tire & Rubber Co., Buffalo, New York. Another branch established by this company at 1009 Forty-fifth street, Milwaukee, Wisconsin, is in charge of C. E. Neumann.

The Bryant Tire Co. has opened an attractive store at Fulton and Franklin streets, Peoria, Illinois, where a full supply of Firestone and Oldfield tires will be carried. F. L. Bryant is manager.

L. J. Adams, as successor to M. E. Majors, has been placed in charge of the branch offices at Indianapolis, Indiana, maintained by The Yale Tire & Rubber Co., New Haven, Connecticut.

The Western Tire & Rubber Co., 2121-23 South Michigan avenue, Chicago, Illinois, dealer and jobber in tires, tubes, and accessories, also has two branch stores at Cicero, Illinois, and Milwaukee, Wisconsin. I. Handelman heads the organization.

The Servus Rubber Co., manufacturer at Rock Island, Illinois, of rubber and canvas footwear, is planning the erection of a second plant unit. The new building will be three stories in height, of brick construction, and measuring 80 by 150 feet. Executives of the Servus organization include: Judson J. Adams, president; Lawrence B. Icely, vice-president; John T. Crowley, vice-president; William T. Church, secretary, and Irvin S. Rauch, treasurer.

With increasing business the Hodge Tire & Supply Co., Springfield, Illinois, has been forced to move to larger quarters where new equipment has been installed, while the building has enough storage space to carry several carloads of tires at one time. D. B. Hodge is owner of the plant and president of the organization.

A recently organized midwestern company is handling Goodyear tires exclusively under the name of the Barlow Auto Supply, with offices at Church and Chestnut streets, Rockford, Illinois.

It has been unanimously decided by the voting trustees of the Racine Horseshoe Tire Corporation, Racine, Wisconsin, to dissolve the voting trust and place the control of the organization in the hands of its common stockholders. There has been a steady improvement for some time in the company's net earnings, the plant having been operating at capacity since September, 1923. The Racine Horseshoe Tire Corporation is one of the oldest of the smaller tire companies.

Increasing business is reported by the Mullen Tire & Vulcanizing Co., 725 Center avenue, Sheboygan, Wisconsin, necessitating the installation of new equipment at the company's service station. D. R. Mullen is general manager.

The Struble Tire & Accessory Co., 507 Ohio street, Terre Haute, Indiana, is a wholesale and retail distributer of Firestone tires and accessories, as well as Oldfield casings and Hartford shock absorbers. According to Mr. Struble, every one of his customers taking balloon tires has been satisfied with his purchase, while sales of such goods in his section of the country have been exceptionally large.

The Swernbuild System, Kokomo, Indiana, is a recently established corporation dealing exclusively with drum tire building equipment, particularly specializing in tire forming methods. Executives of the organization include W. E. Swern, president, and G. H. Morrow, secretary and general manager.

The Frankfort Battery & Electrical Works has been recently organized at Frankfort, Indiana. F. A. Colver, of the Colver Machine & Iron Works, is the owner of the new concern.

The Minneapolis, Minnesota, branch of the Ajax Rubber Co., Inc., 218-222 West 57th street, New York, N. Y., has been recently removed to larger quarters at 1221 Harmon Place. The company also announces another change of address of one of its branches from 317 Broadway to 314-316 West Second street, Oklahoma City, Oklahoma.

A. C. and R. A. Magnuson are acting as Minneapolis distributers of General tires, and are carrying on operations as the General Tire Company of Minneapolis.

Dunlop tires exclusively will be handled for the city of Minneapolis by the George E. Miller Tire Co., 1208 La Salle avenue, Minneapolis, Minnesota.

The Flexo Supply Co., specializing in Kant-Leak pipe joints, has recently moved its main offices from 201 Merchants Exchange Building to larger quarters at 104-6 South Main street, St. Louis, Missouri. The company's plant is maintained in East St. Louis, Illinois.

The Cornell Tire Sales Co., 1705 Grand avenue, Kansas City, Missouri, has been organized to handle in the southwestern territory the Coronada and Butler tires and tubes manufactured by the Corona Cord Tire Co., Butler, Pennsylvania.

Buckley-Pannell-Setzer, Inc., 3569-73 Lindell Boulevard, St. Louis, Missouri, having succeeded the Campbell-Niedringhaus Co., is now distributer of Lee tires not only in the city of St. Louis but also throughout eastern Missouri and southern Illinois. H. G. Buckley is manager of the new organization.

Greatly increased business is reported for this year by the Iowa Cord Tire Co., Inc., with offices and factory at 24th and Scott streets, Des Moines, Iowa. Plans are being considered by the organization to increase the daily production of the plant by approximately 250 tires. C. L. Archer is general sales manager.

A distributing depot has been established in the city of Des Moines, Iowa, by the Lee Tire & Rubber Co., 33 West 60th street, New York, N. Y. This department, of which Clarence L. Welch is manager, is under the direct supervision of the Omaha branch, and has been established in order to facilitate prompt deliveries to dealers in that territory.

The Rubber Trade on the Pacific Coast

Manufactured Goods

Balloon tires have certainly caught the fancy of Pacific Coast automobilists, as the lively trade in "doughnuts" indicates. Dealers complain that they cannot get them fast enough from the eastern and mid-western manufacturers; and the big demand is affording many dealers and manufacturers a chance to market oversize cords by way of compromise. The California Goodyear plant has contracted for an extensive balloon equipment, but molds and mandrels have been arriving so slowly that the factory has been compelled thus far to depend almost wholly on the parent concern in Akron to help in filling balloon tire orders, only a small number now being turned out daily at the Los Angeles plant. An excellent sale is reported in all the large cities on the Coast for standard cord tires and tubes, and some manufacturers of these goods have lately placed some good-sized orders in Trans-Pacific markets, even though high tariffs in several oriental countries tend to greatly check other American exports.

Makers and dealers report an excellent sale of second class tire repair materials, but a poor demand for first grade stock. Many agents and jobbers are apprehensive of a cut in tire prices very soon, and this fear of early price slashing (particularly on cords, which are mentioned in the trade rumor) deters them from carrying more than enough casings and tubes to meet current needs. Even though seasonal sales prospects could scarcely be more encouraging, hand to mouth buying continues to be general. The hope is that cheap rubber will mean cheap tires.

Footwear dealers report that crêpe rubber soles are becoming very popular on the Coast among both men and women and for both street and sport uses; but many of the large distributers, while welcoming the newcomer, still think that the crêpe sole is but a passing vogue and are handling stocks cautiously.

An excellent trade continues in oil industry supplies, particularly in suction and discharge hose, oil well packers and pipe rings, valves and sleeves for pumps; and the demand has increased notably of late for steam piston, rod, and sheet packing, as well as for a wide range of rubber accessories for automobiles and a great variety of standard and novelty mechanical rubber goods. Some large orders have lately been placed for rubber hose for railroad car equipment.

Westinghouse Builds Half Million Dollar Unit

A second unit costing approximately half a million dollars is soon to be erected at the Emeryville, California, plant of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania. The new construction will consist of three-story sections, while the ground space covered will measure approximately 200 feet in width by 245 feet in length. Accommodations for a warehouse as well as service and repair shops will be included in this new unit, while the most modern types of machinery are to be installed.

San Francisco

The Western Rubber Ace Co., 312 Clay street, making a sponge rubber inner tire, will not for some time to come, according to President E. J. Palmer, undertake building a factory here as had been planned, more satisfactory arrangements having been made with the parent concern in the midwest for supplying the Coast trade. Mr. Palmer reports the business done on the Coast between January 1 and April 1, 1924, as being 62½ per cent of the 1923 total and that the outlook is very encouraging. E. Marion Crawford is vice-president and Howard Paul secretary and treasurer.

Coast representatives of the Boston Woven Hose & Rubber Co., who have long been campaigning for the adoption of the 5/8-inch standard for garden hose, are elated over its adoption by the Mechanical Rubber Goods Manufacturers' Division of the Rubber Association of America and the National Hardware Association. They predict as a result a marked increase in hose sales, not only of the product of their company but of all concerns conforming to the new standard. Coast trade still clings to the ½- and ¾-inch sizes, unlike the East and Midwest.

"Working night and day to fill orders," is the report of the Pioneer Rubber Mills, Pittsburgh, Contra Costa County, with main offices in San Francisco. Demand is unusually heavy for belting, light and heavy hose, and mechanicals generally, and the prospects are said to be excellent for the remainder of the summer, when some further additions may be made to this steadily growing plant.

O. S. Tweedy, vice-president of the McKone Tire & Rubber Co., Chicago, Illinois, has been lately studying trade conditions on the Coast.

Following a second trial, Jesse Jacques Eiseman, Alex. R. Abrams, Holman Ives, and Nicholas J. Whelan, who were organizers and officials of the Coast Tire & Rubber Co., were recently found guilty of conspiracy to violate the California state corporation securities laws and held for sentence, the maximum penalty being five years' imprisonment and $5,000 fine.

Cathin Wolfard, who opened the Portland branch of the Mason Tire & Rubber Co. in 1918 and has been the company's northwest manager, is now Pacific Coast manager with headquarters in San Francisco.

Los Angeles Notes

Balloon tires are being made at the plant of the California Goodyear Co. in Los Angeles, but production is handicapped by the slow arrival of equipment ordered from the East. However, general business has been much better this spring than a year ago, and the lifting of the restrictions on automobile travel due to the cattle epidemic in the Southwest has greatly accelerated tire sales. L. C. Buxton, sales personnel and service manager, has been spending several weeks at the Goodyear plant in Akron.

Despite slow buying generally of tires, trade is steadily picking up with the Hendrie Rubber Tire Co., Compton, a Los Angeles suburb. The company reports sales of inner tubes particularly good.

A large order for rubber-faced pulleys has been placed with the Long-Turney Corporation, rubber manufacturer, 1920 E. Vernon avenue, Los Angeles, by one of the largest pump concerns in the West. The plant is also very busy making hard rubber electrical goods and general mechanicals. G. S. Long is president.

Golf balls of extra quality will be made by the Reilly Rubber Co., 2432 E. 56th street, Los Angeles, suitable equipment having been installed, according to J. R. Reilly, president. The company has since its inception specialized on high grade red and gray inner

tubes, and to meet increasing demand has been obliged to put on a night shift.

The Samson Tire & Rubber Co., 410 W. Pico street, with works at Compton, a Los Angeles suburb, reports having done in 1923 fifteen times the business done in 1918, the company's first year; and for the past four months a considerable gain was scored over the same period in 1923. The plant doubled its capacity last October and is now working on three shifts daily. Within the past year it has trebled the number of its selling agencies on the Coast.

W. O. Rutherford, vice-president of The B. F. Goodrich Rubber Co., Akron, Ohio, president of the Rubber Association of America, and chief executive of the Motor and Accessory Manufacturers' Association, has been a recent visitor on the Coast. He expressed much satisfaction with the general outlook for business in the far west, and in referring to the rubber industry of the country said that it never was in a sounder condition, much improvement in it of late being due to economies effected in selling and distributing, the cost of which had been out of fair proportion to the total business done.

General Manager E. F. Norton of the Spreckels "Savage" Tire Co., San Diego, has just completed a tour of the principal cities of California, Oregon and Washington and reports having established many new sales agencies. The company is said to be doing exceptionally well since it went under the new management last December, and it now confines its sales entirely to the territory west of the Rockies.

Pacific Coast Notes

The Cassidy Tire Co. has recently bought out the Sunset Tire Corporation, formerly located at Sixth and Salmon streets, Portland, Oregon, and has put up additional concrete and steel buildings. The company will carry a full line of tires and accessories, and also maintain a very complete service station. George K. Cassidy is manager.

The Dunlop-Fox Tire Co., 925 Pike street, Seattle, Washington, is the representative of the Dunlop Tire & Rubber Co., Buffalo, New York. The Seattle organization has distribution rights in Washington, Oregon, Idaho, and part of Montana as its upper Pacific coast territory.

The Victory Rubber Co. was at one time engaged in the production of rubber heels, soles, mats, the address being 3753 Brooklyn avenue, Seattle, Washington. The plant is now subject to sale, including building and four city lots, or the machinery separately. A. H. Wiseman, 507 White Building, Seattle, Washington, is the company's attorney.

The American Zinc Sales Co., Columbus, Ohio, has appointed Martin, Hoyt & Milne, Inc., San Francisco and Los Angeles, California, as general sales agent for the Pacific Coast, the new organization to handle Azo brand zinc oxides. Warehouses carrying adequate stocks of these materials will also be maintained at San Francisco and Los Angeles.

"PERMALLOY" CABLES

Following successful tests made off Bermuda last summer with 120 miles of experimental "permalloy" cable, the same nickel-iron alloy is to be used in the proposed construction of a new cable to be laid by the Western Union Telegraph Co. from New York to the Azores. According to *Science Service*, the new cable differs from the old form only in having a thin "permalloy" tape wrapped around the copper wire beneath the gutta percha insulation. The new metal, which was invented in the laboratories of the Western Electric Co., is composed of about 80 per cent pure nickel and 20 per cent pure iron. It is said to be the most easily magnetized and demagnetized of all metals.

Canadian Notes

The first six months' business of the Goodyear Tire & Rubber Co. of Canada Ltd., Toronto, Ontario, was on a par with the corresponding 1923 period. Vice-president and general manager C. H. Carlisle stated: "Business for the first six months of our fiscal year was slightly less in dollars and cents, and in units as compared with a year ago. I forecast that our year's business will be equal to or greater than 1923." Regarding the abolishment of the McKenna preferential tariff by the Labor Government of Great Britain, Mr. Carlisle said: "The only detrimental effect it will have on the rubber industry will be in the equipment of export cars. Should Canadian cars cease being exported to England we would lose the tire equipment on these cars, which would only amount to a small percentage of the total business yet it is a factor in overhead and buying power."

From 3,000 automobiles registered in the Province of Quebec in the first six weeks of the automobile year, the number was jumped to 43,000. Last year the total number registered in Quebec Province in the course of the year was slightly over 71,000 and it is expected that the 100,000 mark will be attained this year.

The hockey team of the K. & S. Tire & Rubber Co., Toronto, passed through a most remarkable season. Against stiff opposition they won the senior Toronto Industrial Association League and gained possession of the K. & S. Trophy offered to the winners of this league. They also won the Senior Championship and C. C. M. trophy, by defeating the teams of Canadian National Carbon Co., and Canada Cycle & Motor Co., Ltd. This is the second year in succession that K. & S. have held the senior championship, and in the past three years the team has lost only two games.

Prices that will be effective for fall requirements of Dunlop weatherstrip manufactured by Dunlop Tire & Rubber Goods Co., Ltd., Toronto, have been issued to the trade. Red Coat and Green Coat are unchanged in price, while in the case of Black Stormproof a reduction of $2 per 100 boxes is noted.

The Northern Rubber Co., Guelph, Ontario, have opened offices at 68-70 St. Antoine street, Montreal, where they are showing samples of rubber footwear to the trade; also a full line of Partridge tires.

The T. M. Ramsay Co., 626 Howe street, Vancouver, British Columbia, dealer in tires, batteries, etc., has been appointed distributer throughout the district for Goodrich truck tires.

REPAIR WELDING ON MACHINERY

The severe strains to which rubber working machinery are subjected in mill, calender and press rooms, often result in inconvenient and expensive breakages. Even bad breakages are repairable when the services of a scientific welder can be requisitioned, the repaired part often being restored to its original effective condition by scientific welding at much less cost than a new replacement part and frequently with great saving in time and production.

Examples can be cited where the well-nigh hopeless smash-up of an important machine, gear, housing, or bearing has been rectified by expert welding. The application of this method to the repair of broken castings requires expert operators working under the direction of a metallurgist trained in high temperature treatment of metals, and commanding the facilities of a workshop specializing in welding heavy and complicated pieces.

PERU'S IMPORTATIONS OF AMERICAN TIRES AND TUBES HAVE been steadily increasing during the last three years. The total values for all three lines of goods, inner tubes and both solid and pneumatic tires, are estimated as being: for 1921, $175,879; 1922, $210,904, and 1923, $226,733.

The Rubber Trade in Europe

Great Britain

LEGISLATIVE measures of expected benefit to the rubber industry are receiving the attention of both producer and manufacturer, in particular the renewed agitation for a British tire import duty. Meanwhile the annual reports from producing companies continue to sound an encouraging note, while the following extract in regard to the Stevenson restriction measure as quoted from the fifteenth annual report of the Rubber Growers' Association will be of interest to all connected with the industry:

"It is no mean achievement to have reduced world stocks by some 40,000 tons, which in effect is equivalent to having kept down the pressure by 100,000 tons. It is true that if the restriction measures had not been introduced the actual supply of rubber put on the market would have been less than the potential normal production by reason of the bankruptcy which would have overtaken a large proportion of producers. The legislation has kept the industry as a whole solvent, it has enabled the acreage under rubber to be put into a first-class condition of upkeep, it has allowed modest dividends to be paid to shareholders, and has brought about a nearer approach to stabilization in the price of rubber than has hitherto been possible.

"What the legislation has meant to producers is easily expressed in £. *s. d.* It has increased the average selling price by about 5*d.* a pound or £50 a ton, which on 350,000 tons of plantation rubber means £17,500,000, and three-quarters of this output is in British ownership or in British territory."

R. G. A. Urges Cooperative Selling

A further step has been taken by the Rubber Growers' Association in its wholehearted enlistment in the cause of cooperative selling as a means of assisting the industry. A circular is being sent out by the executives of the Association to all members, urging them to give support to this project for improvement in the marketing of plantation rubber. These attempts are eliciting many comments, both favorable and unfavorable, the plan as a whole being considered a countermove to the measure suggested by Mr. Hoover, United States Secretary of Commerce, regarding joint buying agencies for the purchase of raw materials, among which rubber is included. Announcements as to the results of the campaign will be awaited with interest.

Automotive Industry Questions Proposed Removal of Protective Duty

British manufacturers of motor cars as well as tire makers are viewing with alarm the proposed plan for removal on August 1 next of the 33⅓ per cent. ad valorem duty on automobiles coming into England, as provided in the new government budget. Manufacturers of motor cars as well as the workers believe that the abolition of the present tax will result in the flooding of the country with low-priced foreign cars, to the detriment of the British industry, which is just now entering upon a period of expansion, due in part to the present import duty.

The tire industry in particular, which has had to maintain itself in the past with no assistance from a protective tariff, is especially threatened by the proposed measure. Should the tax on motor cars also be removed, there will be numbers of cars entering the country equipped with foreign-made tires, and statistics have shown that motorists when renewing tires almost invariably continue using the original make of equipment. Thoroughly aroused by the situation, the tire manufacturers of the country and those representing the motor industry will join in an effort to have the proposed measure promptly killed, if possible.

Alexander Johnston, president of the North British Rubber Co., states as his view of the question:

"American mass production methods, which mean greatly reduced overhead charges per unit, and European depreciated currencies, will form two factors against which, in my opinion, it will be impossible for British car manufacturers to successfully fight, if the McKenna duties go. What is happening in the tire industry, where last year over three-quarters of the total estimated annual consumption of motor tires were imported (although British manufacturers could produce the lot), will be repeated in the case of the car trade.

"If the McKenna duties come off, I predict that the British motor industry will be virtually extinguished within three years."

Great Britain's Tire Imports

According to statistics compiled by a well-known American tire manufacturing organization, England and northern Ireland combined purchased during the first nine months of 1923 a total of 1,030,208 pneumatic casings, valued at £2,288,982. Of this importation the American share represented 31 per cent in cash value, Italian about 25 per cent, and French a few per cent less.

In lorry tires the United States also was far in the lead. Of the 44,879 imported by Great Britain, valued at £184,579, the United States shipped £94,930; France, £33,802; Italy, £16,687; Germany, £14,857.

France, however, led in the exports to England of inner tubes, sending goods valued at £100,661, while the total stood at £288,285. The United States followed at £94,578.

More Rubber Paving Projects Appear Successful

Following the successful rubber paving experiment in Oldham street, Manchester, the executives of the London and Scottish Railway Co. are planning to put down additional rubber paving in St. Pancras station. On the stairway at the new Southgate station of the London and North-Eastern Railway, where there is a large amount of traffic, the Leyland & Birmingham Rubber Co. has recently been installing rubber treads, similar to those already laid by this company at New street station, Birmingham, and the Elephant and Castle station, London. All of these last-mentioned installations are said to have successfully withstood adverse conditions to which other materials have finally succumbed.

Goodrich Interests Secure British Plant

With a view to manufacturing rubber goods on British soil, The B. F. Goodrich Company of the United States has recently purchased the Ajax Rubber Works, at Leyland, in Lancashire. The purchase includes the sole right to make both solid and pneumatic Wood-Milne tires as well as certain other rubber goods. About £50,000 will be expended in the installation of new equipment, while all the patents, processes and technical devices which the American company has acquired in its more than fifty years of operation will be available in serving the interests of the new organization. The property includes about ten acres of land at Leyland, where the proposed plant operations will give employment to several thousand British workmen.

Institution of the Rubber Industry

Considerable discussion followed the interesting address regarding "The Physical Testing of Rubber," given by Dr. Philip Schidrowitz at the meeting on March 28 of the Birmingham Section of the Institution. Various suggestions were made by those present, but the consensus of opinion seemed to be that there was much yet to be learned regarding the testing of rubber, which material might soon have to be used in a much bigger way than at present.

At the meeting on April 7 of the London Section, some humorous remarks concerning British rubber goods were made by H. F.

Trevillion in his address, "The Buyer Criticizes the Rubber Manufacturer." According to the speaker, the British products, especially rubber footwear, were too often turned out with little regard for style, while "the typical rubber glove, like the British rubber boot, was as strong as a battleship." Mr. Trevillion made particular reference to the corresponding American manufactures, especially as to their color and style.

British Industries Fair

This year at the tenth British Industries Fair, held at the White City, there were more visitors than usual, due to the many who had also been attracted by the British Empire Exhibition at Wembley. The London Section of the Fair continued from April 28 to May 9, and the Birmingham Section from May 12 to May 23.

British Notes

The Isleworth Rubber Co., Limited, has been sending out circulars announcing the company's amalgamation with William Warne & Co., 29 Gresham street, London, E. C. The works of the latter concern are at Tottenham and Barking.

Alexander Nourry has been recently appointed sales manager of the Northwestern Rubber Co., Litherland, Liverpool, a well-known organization specializing in the manufacture of reclaimed rubber.

Pirelli, Limited, 144 Queen Victoria street, London, E. C. 4, is now guaranteeing the company's solid band tires for 12,000 miles, without restriction as to time. Pirelli has recently issued a booklet entitled "Some Photographs and Appreciations."

During the calendar year 1923 the United Kingdom exported to Canada crude rubber valued at $1,317,997. Similar exports to Canada from the United States totaled $5,621,780.

It is said that London's principal omnibus concern has equipped its vehicles with cushion tires, which are giving entirely satisfactory service.

Belgium

Sixth International Rubber Exhibition

The Sixth International Rubber Exhibition opened in the Halle du Cinquantenaire, Brussels, Belgium, April 1, and continued until April 16. Thousands of visitors were in attendance, particularly as the exhibition was being carried on in conjunction with the Fifth Commercial Fair of Brussels.

Belgian rubber organizations were fully represented, particularly the following: O. Englebert Fils & Cie., Jenatzy-Leleu, O. & R. Gheysen Freres et Cie., Société Colonial Rubber a Gand, S. A. Belge du Caoutchouc Mousse, and Société Commerce et Industrie du Caoutchouc. The rubber engineering interests of France were represented by Etablissements A. Olier, which exhibited types of rubber machinery.

Displays of English rubber companies probably ranked next in importance to those of Belgium. The most interesting part of the Rubber Growers' Association exhibit was the Propaganda Section, where many of the leading rubber manufacturing organizations of Great Britain had united in displaying articles illustrating new uses for rubber.

Among individual English organizations was a very comprehensive exhibit of the numerous products of the North British Rubber Co., conspicuous among these articles being samples of "Paraflor," a new type of floor covering intended as a substitute for linoleum. The attractive exhibit of the Faultless Rubber Co., the only American organization exhibiting under its own name, was attended by its British distributer. At the stand of the Rubber Regenerating Co. various grades of reclaimed rubber were in evidence, as well as an assortment of rubber goods manufactured from them. A large and cleverly decorated stand was that of the Anchor Chemical Co., Limited, an English organization which represents in Europe the American concern known as the United Oil & Natural Gas Products Corporation. This stand, with its comprehensive exhibit of chemicals used in the rubber trade, was decorated entirely in black and white, evidently as a symbol of "Dixie" carbon black.

The well planned display arranged by the Rubber Association of America attracted much attention. The exhibit comprised three salons, placed on a raised platform in the center of the Exhibition Hall, while in a conspicuous position was shown the wax figure of a Malayan tapping a rubber tree. In the first room appeared the raw materials commonly used in the rubber industry; the main room was devoted to tires, mechanical goods and footwear, while in the third salon rubber sundries and specialties shared the space with a balopticon. Here were also shown rubber shackles and bumpers used in the United States on motor trucks. As a whole, the display of the Rubber Association well illustrated America's position of importance as the leading consumer of crude rubber and the largest manufacturer of rubber goods.

In connection with the Exhibition, a series of conferences was held, during which papers dealing with various aspects of the rubber industry were read and discussed. The chief advantage of such international conferences is the opportunity afforded for the interchange of opinions and the comparison of views in regard to a most important industry.

Germany

The Berlin rubber industry was visited by a strike that lasted from March 29 to April 22. The cause of the strike was as follows: A little while ago the 9-hour day was fixed for the chemical industry. This decision was repudiated by the workers in the rubber industry, who maintained that for them only the 8-hour day, including intervals for washing, could be taken into account. As a result of this a second judgment was issued, expressly stating that the ruling relative to the 9-hour day was to apply also to the rubber industry.

When the rubber works in Berlin tried to make use of the new ruling and enforce the 9-hour day, the workmen went on strike and the factories declared a lock-out. At first all the Berlin works were affected, but after awhile work was resumed in a few. The Continental-Caoutchouc und Gutta-Percha Compagnie, Hannover, was also closed part of the time, putting 12,000 persons on the streets.

However, the strike ended on April 22, the factories being the victors. Work has been resumed on the new basis, 9 hours a day, exclusive of intervals for washing.

No doubt industries where the 9-hour day has not yet been enforced will not delay to follow suit. That the 8-hour day will soon be a thing of the past in Germany is further emphasized by a ruling to the effect that unemployed laborers refusing to work more than 8 hours a day forfeit all rights to the customary unemployment dole.

Reformation of the German Rubber Industry

Some interesting views have been expressed in the columns of recent issues of the *Gummi-Zeitung* regarding this subject. There is a strong feeling here that the local industry needs to be organized in order that the greatest efficiency and economy in manufacture be attained and further that home and foreign markets be properly cultivated. One writer considers as the fundamental defect in the rubber industry in Germany today the jealousy and lack of confidence among manufacturers. The working of all factories should be investigated and existing defects in systems removed. To this end a technical commission should be formed which would take up the questions of scientific management of the factories, standardization, lowering costs and raising the output. Then the foundation would be laid for a close economic union.

Another writer treats particularly of the solid tire branch. He points out that although there are recognized a limited number of standard sizes, manufacturers actually make and carry no fewer than 141 different sizes. These should be reduced to 11, the cross-

section of the profile should be standardized and mixings made uniform.

To develop home demand, it is suggested that the American and British examples of intensive propaganda for rubber goods be followed in Germany. People here are not at all sufficiently well acquainted with the numerous uses to which rubber has been put and a number of articles which find a wide use in America are but little in demand, for instance hot water bottles, and to a certain extent rubber aprons.

Incidentally it is worthy of remark that the increased local demand noted in so many industries is not looked on by all as a good sign. Many are fearful of what it will do to the foreign note situation which plays so important a part in the purchase of raw materials of foreign origin, and to the Rentenmark.

German Notes

The Continental-Caoutchouc and Gutta-Percha Compagnie has transferred its foreign business to the Internationale Continental Caoutchouc Compagnie, Amsterdam, Holland, in order that the separate foreign territories may receive the necessary individual attention. To expedite business the company will open an office at Wahrenwalder Strasse 100, Hannover, to which all correspondence is to be sent.

A new protection for pneumatics has recently been patented by the firm of Heinrich Bodenstein, Hannover, and consists of a ribbon of rubberized material with a device by means of which it is connected with the felly. The strip is easily put on, after which the tire may be inflated again and the vehicle is ready to proceed on its way. This ribbon is said to make a good and durable repair.

The Sachsland Gummiwarenfabrik, Bürgel, Thüringia, has recently put on the market a novelty known as the *Wunderblume* (Wonder Flower), an inflatable rubber flower that blooms and fades.

In accordance with the provisions of the French rulings of December 29, 1923, based on Article 68, of the Versailles Peace Treaty, Alsace Lorraine may export to Germany, duty free, among others, 35 tons of rubber goods and 168 tons of rubber waste during the period January 11, 1924, to January 10, 1925.

France

The American method of packing each pair of rubbers in a separate box with the size marked on it is the reason why dealers in Strasbourg prefer the American product, while purchasers like the extra thickness at heel and toe in American-made rubbers. The season for rubbers is from October through December and the principal jobber of American rubbers disposes of 10,000 to 15,000 pairs in an ordinary season. In normal times the city is the distributing center for part of Germany, part of Switzerland and to a certain extent of interior France as well as the Alsace-Lorraine district. At present, however, the purchasing conditions resulting from the fall of the French franc threaten to interfere with the sale of American rubbers here.

Spain

In Madrid, the recent increase in tire prices has had a favorable effect on sales of American tires. At present Michelin leads in this market, followed by two American makes, French-Goodrich and Dunlop, the latter of which is rapidly gaining in sales. Prices of Michelin balloon tires here are: casings 715 by 115, 125 pesetas, tubes 25 pesetas (7.40 pesetas = $1); 730 by 130, 176 pesetas, tubes 29.50; 775 by 145, 214 pesetas, tubes 31 pesetas.

In the Barcelona district, too, American tires have good prospects, as they have met Michelin prices. Here, also, Michelin leads, followed by Dunlop, four American makes, and Bergougnan. The Spanish factory of Klein has stopped making tires but is testing a new process, while the National, which is now closed, expects to reopen soon as the National Pirelli.

Turkey

Whereas America led in the Turkish market for rubber footwear in 1920 when her exports to these parts valued $220,500 against English shipments at $122,578 and Russian at $3,700, the last few years have seen American makes lose their popularity. The cause is said to be exchange conditions, lack of proper advertising, lack of competent agents, and the inferior qualities shipped in recent years. Sixty per cent of the rubbers now come from Sweden and France. The most popular brands in the order named are Trapetz (Russo-Sweden), Gislaved (Sweden), Le Coq (France), Rhombus (Russia), L'Aigle (France), Albion and Antæus (England), and two American brands.

The import duty on rubber footwear amounts to about $6.50 per hundred pounds. It is estimated that over half a million galoshes are sold annually, fifty per cent of which is taken by the large cities, while Anatolia buys the rest. There are about 50 importers for all Turkey.

European Notes

Lithuania

In Lithuania, the Hutchinson rubbers made by the Etablissements Hutchinson, Paris, have displaced German makes in popularity. The best grade Hutchinson can be had for $1.40 a pair; however the cheaper grades at $1.00 and $1.10 a pair are more popular.

The largest dealer in rubbers is G. L. Falkowski, of Kovno, the sole agent for Etablissements Hutchinson. Sales of rubbers fell off last year and not more than 200,000 pairs were sold throughout Lithuania.

Latvia

The comparatively large number of cars of American make in Latvia together with good results obtained makes the outlook for American tires favorable. In 1923 2,000 tires and tubes were imported, America supplying 20 per cent, England 35 per cent and Germany 40 per cent.

The imports of bicycle tires and tubes in 1923 were 6,600; most of this was sent by the Continental.

Denmark

Revised official statistics give imports of solid tires in 1923 as 264,300 kilos. Of this Germany supplied 98,000, England 84,300, America 36,000, Italy 15,000, France 16,800, Holland 9,400.

Finland

Six American brands of tires are on the Finland market but they have difficulty in competing with European tires as far as price is concerned. Michelin prices in marks (39.99 marks equal $1), for Clincher Cords are: 760 by 90, 847; 815 by 105, 1,093; 820 by 120, 1,427; 30 by 3½, 873.

Hungary

Owing to depreciation in currency, prices of tires have advanced 100 per cent. The tire business of Budapest is practically restricted to Dunlop, Michelin, Continental, Pirelli and two American makes.

Fairs and Exhibitions

Russia

It is learned that at the forth-coming fair at Cologne, the Union of the Socialist Soviet Republic will be represented by a comprehensive exhibit of Russian products. In a special Russian Pavilion everything that Russia can now export will be shown, including besides raw materials, partly finished goods and products of national art, also asbestos, rubber manufactures and other articles.

Italy

From May 31 to June 15, 1924, an International Automobile and Sports Exhibition is to be held at Turin in the Palazzo del Giornale and in the Stadium. All kinds of accessories for motor vehicles, bicycles, and for sports in general will be exhibited.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

THE RETURNS of rubber exports for the first five months of the second restriction year give much food for thought. They show that from November, 1923, to March, 1924, the total exports were 108,580 tons against 106,491 tons during the corresponding period of 1922-1923, which is an increase of 2,089 tons. From the totals, however, are deducted the imports of rubber, chiefly from the Dutch colonies, amounting to 39,582 tons for the 1923-24 period and to 21,288 tons for 1922-23. This leaves net exports of 68,998 tons and 85,203 tons respectively and would indicate that while restriction was so far more effective that it produced a decrease of 16,205 tons in shipments of Malayan grown rubber, this decrease was counterbalanced by the increase of rubber of Dutch origin, amounting to 18,294 tons. In this case, hard feelings toward the Dutch are easily understood. However, it is doubtful if all the foreign rubber is really from the Dutch East Indies. It has been pointed out that a large part of this is rubber smuggled out of Malaya and reshipped as of Dutch production.

Now as to the balance, this is chiefly native rubber, wet, sticky, dirty, and sent to Singapore to be reworked. Since this rubber loses 15 to 20 per cent in weight during the cleaning process, the original imports must be reduced by that amount, which causes a corresponding increase in the shipments of Malaya-grown rubber. That is to say, the working of restriction in Malaya is not as satisfactory as it is said to be, while on the other hand its failure to bring about the desired results cannot entirely be laid to the Dutch.

The trouble with the Malayan rubber industry is that it lacks organization. Soon after the slump set in, the necessity for proper organization was urged; but it cannot be said that anything has been done in this direction. People blame the government and they denounced the Dutch, but that is about all.

New Scale Proposed

Revision of the Stevenson scale has come up for consideration. The present scale for the release of rubber is held to be unsatisfactory. It is thought that, considering the present scale of release, the pivotal price should be adjusted so as to insure a more adequate return on the capital cost during the period when the percentage only of full crop is salable. The following scale, giving the desired returns at different percentages, is recommended:

Per cent	Pence	Per cent	Pence
90 to 100	15	65	19
80 to 85	16	60	20
75	17	55	21
70	18	50	22

To facilitate the quick release of rubber to meet sudden increased demand, it is suggested that 10 per cent should be added to the percentage in force when the average price for the quarter is over 20 *d.* and 20 per cent when it is over 21 *d.* To meet the opposite condition, a deduction of similar percentages is suggested when the average price is under 16 *d.* and 15 *d.* respectively.

It is hoped that such a revision, if brought about, will influence Dutch decision and may make them more ready to join the British in restricting.

"Danger Arrived"

This is the heading a correspondent in a local paper puts over a black picture of the situation. The steady fall in the price of rubber has reacted against economic conditions in general here. As is known, rubber is the main industry of Malaya and the prosperity of the peninsula depends upon conditions in the rubber market. Each drop in the price of rubber is followed by a decrease in demand for imported goods and by more insistent requests for extension of credit facilities. Several serious failures have been reported in the last six months. Rubber securities have become unsalable, entailing pressure from banks and severe loss on those who are forced to sell. In brief, things are gradually returning to the condition they were in before restriction. The only remedy is immediate and further reduction of output; Dutch cooperation must be achieved, or Malaya must prepare to meet the consequences, which will not be pleasant.

Netherlands East Indies

The Department of Agriculture, Industry and Commerce, Buitenzorg, Java, has published an interesting article on the rubber situation in the Netherlands East Indies.

The growth of exports since 1917 is illustrated by the following table, in which the amounts represent metric tons (2204 pounds):

	Total Exports	Output of estates in Java	Output of estates in North Sumatra	Exports of Native Rubber
1917	45,713	18,933	23,407	3,500
1918	44,094	22,254	26,193	5,000
1919	89,725	26,826	35,696	13,000
1920	76,929	27,258	38,145	10,000
1921	73,402	24,514	33,883	6,000
1922	103,458	28,902	39,169	25,000
1923	139,746	35,000	43,000	53,000

The output from estates shows a gradual increase except for a set-back during 1921. The shipments of native rubber, which amounted to only 8 per cent of the total exports in 1917, rose to over 15 per cent by 1919 but decreased sharply in the next two years, only to leap to 24 per cent in 1922 and 38 per cent in 1923.

Two factors are responsible for the rise in exports and production, the first being the fact that after 1915 estates were considerably extended so that large new areas came into bearing.

A comparison of new plantings in the East Coast of Sumatra and Malaya shows that as far as absolute figures go, expansion amounted to about the same in both centers, but in proportion to the extent of the land planted up to 1915, expansion was more than twice as great in Sumatra as compared with Malaya, that is, 110 per cent and 44 per cent respectively. In Sumatra, too, the planted area under three years old was 20 per cent of the total area, while in Malaya this was only 9 per cent. Leaving all other factors out of consideration, this alone demonstrates that the producing capacity here increased much more rapidly than in Malaya, and will rise still further in the near future. Figures for the years 1920-1922 indicate that in 1922 more than a third of the planted area in Java and Sumatra had not yet reached the tapping stage.

Statistics from Malaya show that in that country the large European estates increased their acreages by 46 per cent since 1916; Asiatic estates over 100 acres increased by 91 per cent; estates under 100 acres by 59 per cent and small holdings by 64 per cent.

The second factor which has contributed to the growth in production and exports is the trend of prices. This is particularly notable in the case of native rubber, which steadily decreased during the slump period only to take an unprecedented flight as soon as prices improved.

Restriction and Dutch Cooperation

Relations between British and Dutch planters here have become rather strained owing to the Dutch attitude on restriction. Mr. Van Gennep, president of the Netherlands Indies Agricultural Syndicate, with which the Rubber Planters' Association is con-

nected, definitely declared himself against restriction. The Syndicate consists of 7 agricultural societies which all produce rubber, and so Mr. Van Gennep's opinion expressed before the National Council was of great importance. The effect on the British was such that they threatened to resign from the Association.

In order to restore unity, it was proposed to found a Union of Java Rubber Planters which would include rubber planters in the Dutch colonies. The existing Rubber Planters' Association and the Soekaboemi Agricultural Association are now in liquidation and will be combined into one association which will take part in the proposed Union. As these two associations are the soul of the Syndicate, while the new combine will probably not be connected with the Syndicate, it seems likely that the latter body will disappear.

The complaint of the British against the Syndicate is that costs are too high and that there are too many separate organizations which have to be supported. However, their real cause for complaint is, of course, the attitude of Mr. Van Gennep regarding restriction.

The reproaches of the British against the Dutch are not quite well founded. Rubber cultivation in Malaya is an entirely different proposition from what it is in the Dutch Indies. In the former country it is the pivot on which everything turns. If rubber flourishes, business as a whole prospers; if rubber slumps, ruin stares most people in the face.

In Java, however, rubber is of much less importance. Even its absolute disappearance would not have any fatal results for the Dutch Indies as a whole. And, furthermore, there is the considerable extent of native plantations to be taken into account. European planters may look at the matter from the standpoint of their own interests, but the government must also consider the natives.

There is no denying that the immediate results of restriction were favorable; however, in official circles the feeling is strong that restriction schemes are but so much patchwork—when prices soar as a result of reduced exports, the boom causes such an expansion of planting that before long a new slump is at hand.

Meanwhile, in consequence of the discussions with the British planters at Djaija, the investigation of native rubber is in the hands of the government. It is hoped that some results will be had in a few months' time, but, considering the nature of the task, it will probably be a year before anything definite is known.

Dr. de Vries on Native Rubber

At a meeting of the Bandoeng Rubber Planters' Association, Dr. O. de Vries gave some interesting data regarding the preparation and quality of native rubber. Preparation consists of coagulating with alum; after a quarter of an hour the coagulum is rolled out with the hands or a bottle, after which it is hung up to dry for a few days before it is sold. The "factory" is a bamboo shed; the equipment a leaf or piece of bamboo for spout, a few empty tin cans for cups, and one or two petroleum cans that serve as latex pails and as coagulating tanks.

Most of the native rubber goes to Singapore, where it is converted into amber blankets in the Chinese factories, of which some are very large (with 60 to 90 crêping mangles each), while the rest, the small ones, number almost 200. The loss is enormous. Fresh native rubber contains from 45 to 50 per cent of dirt and moisture. In Singapore the average loss is calculated at 15 per cent. Of the 55,000 tons, therefore, that are put down as exports from the Dutch Indies, about 15,000 tons are dirt and moisture. This quantity ought really to be deducted from the Dutch Indies exports in the Malayan statistics and should be added to the net Malayan exports from Singapore—a small flaw in the statistics that should be taken into account when rubber restriction is under discussion.

The Chinese prepare four qualities of this rubber which, owing to its uniformity, finds a ready sale on the market. Dr. de Vries stressed the point that in New York this rubber has for a year already been sold at only ½ to 1½ cents (American currency) below standard. He once more emphasized that for most purposes the inferior qualities are quite as usable as the standard grades.

Regarding latex shipments, the speaker declared that these had well-nigh stopped. The General Rubber Co. alone continues to ship very large quantities. As for powdered latex, the process is coupled with many difficulties and it will take time before estates will produce powdered rubber.

Piracy and Smuggling

The East Coast of Sumatra was formerly notorious for the number of pirates. Of late, however, they seem to have become more bold and the authorities decided to take the matter in hand. As a result it was discovered that enormous quantities of rubber were being smuggled from Malaya to be transferred to larger vessels and reshipped to Singapore as foreign rubber. The ruling in Malaya is that only on boats of 50 tons, and under, rubber must show certificates of origin, but not on vessels of more than that tonnage, with the above result. In this way the British themselves make a farce of restriction.

Foreign Capital

British capital continues to buy up rubber estates. The Wattie firm has acquired several new lands. It is estimated that at present about two-fifths of the total rubber capital in the Dutch Indies is British. If this goes on, most of the rubber capital will be British within 20 years.

Taxation of Native Rubber

It is reported that the government intends to levy an export duty on native rubber. The intention is to restore the previous tax on gutta-like products, which was temporarily abolished. The reason is said to be the impossibility of including Asiatic profits in income tax. However, the general impression is that this plan is connected with British restrictions, for this tax would help to strengthen restriction. In any event, the direct result of these reports has been an improvement in the market which has acquired a much stronger tone the last two weeks. If the government really puts the plan into effect, further improvement is looked upon as assured.

INDO-CHINA

The exports of rubber from Indo-China during 1923 totaled 56,960 quintals (quintal equals 220 pounds), against 46,228 quintals in 1922. Of this 43,239 quintals went to France in 1923 and 32,363 quintals the year before. The greater part of the rubber, 55,962 quintals and 42,244 quintals in 1923 and 1922, respectively, came from Cochin China; the rest, 995 quintals and 784 quintals, respectively, was sent by Annam.

The imports included insulated electric wires and cables to a total of 4,250 quintals, and tires and tubes amounting to 4,346 quintals. Most of these goods came from France.

FRANCE AND ITALY'S TIRE IMPORTS

It is interesting to note that while France's importations of American tires have declined in value during the last three years, Italy's purchases of such goods have correspondingly advanced. The former country took in 1921 casings, inner tubes, and solid tires valued at $384,358, the figures declining in the two succeeding years to $289,946 and $90,138 respectively.

Italy's total purchase, however, estimated in 1921 at only $25,110, rose in 1922 to $107,129 and in 1923 to $178,909. Italy's production capacity has been estimated at only 850,000 tires yearly, while the corresponding capacity of France reaches 3,500,000.

TRUCK TIRES OF THE CUSHION TYPE ARE SAID TO BE INCREASINGLY popular in France, while the use of such tires is also developing steadily in England.—*Firestone News Service.*

Recent Patents Relating to Rubber

The United States

Issued* April 15, 1924

NO. 1,490,113 Tire valve. J. Kelley and C. Raymond, St. Louis, Missouri.

1,490,157 Life saving device. N. Cherniak, Bethlehem, Pennsylvania.

1,490,183 Multiple tread cushion tire. R. D. Parsons, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,490,296 Mat made of link sections of rubberized laminated fabric assembled on U-shaped bars. P. J. Swanson, assignor to Tire Mat & Bi-Products Co., Inc., both of Seattle, Washington.

1,490,303 Sanitary napkin. R. J. Woody, Chestnut Hill, Massachusetts.

1,490,470 Fireman's trousers, with waterproof lining. W. H. Laubach, St. Joseph, Missouri.

1,490,556 Cushion tire. J. A. Bradley, Milwaukee, assignor of one-half to Albert O. Anderson, Shawano, both of Wisconsin.

1,490,575 Anti-rattler for hoods. A. F. Masury and A. H. Leipert, assignors to International Motor Co., all of New York, N. Y.

1,490,614 Toy balloon. H. A. Loomis, San Jose, California.

1,490,628 Pneumatic tire valve. F. Meyers, New York, N. Y.

1,490,648 Pneumatic tire. C. W. Turner, London, England.

1,490,670 Valve core tester. P. J. Law, Perry, Iowa.

1,490,793 Sanitary urine tube for infants. L. G. Ajamian and Y. E. Ajamian, West Hoboken, New Jersey.

1,490,893 Anti-skid shoe for tires. O. B. Rothermel, Cleveland, Ohio.

Issued* April 22, 1924

1,491,016 Massaging pad. M. J. McGowan, R. E. Ricksen, and P. W. Lennen, Chicago, Illinois.

1,491,086 Sheet rubber slipper. M. M. Dessau, London, England.

1,491,120 Bead strip. A. Vetter, assignor to The Willys-Overland Co., both of Toledo, Ohio.

1,491,136 Tire patch. R. Durossette, Richards, Missouri.

1,491,258 Waterproof ornament for bathing caps, etc. W. Gluckin, Brooklyn, New York.

1,491,412 Belt with resilient filler. J. W. Mowrey, Detroit, Michigan, assignor to Security Rubber & Belting Co., Chicago, Illinois.

1,491,504 Pneumatic tire. J. H. Williams, Gilbert, Alberta, Canada.

1,491,528 Infants' rubber pants. G. K. Guinzburg, assignor to I. B. Kleinert Rubber Co., both of New York, N. Y.

1,491,550 Rubber heel. G. Ross, Lorain, Ohio.

1,491,683 Pressure gage for tires. H. T. Donnell, Washington, D. C.

1,491,690 Baby pants. M. S. George, St. Louis, Missouri.

1,491,696 Bathing sandal. E. A. Guinzburg, New York, N. Y.

1,491,711 Pocket holder for pens, pencils, etc. P. Levine, Brooklyn, N. Y.

1,491,737 Abdominal supporter. E. Poole, Richmond, Virginia.

Issued* April 29, 1924

1,491,782 Sheet rubber protective case for explosive containers. J. W. Ballew, Tulsa, Oklahoma, assignor to Revere Rubber Co., Chelsea, Massachusetts.

1,491,791 Milking apparatus. L. Dinesen, assignor by mesne assignments to Perfection Manufacturing Co., both of Minneapolis, Minnesota.

1,491,792 Milking apparatus. L. Dinesen, Minneapolis, Minnesota.

1,491,864 Pneumatic tire. J. A. Johnson, Indianapolis, Indiana.

1,492,077 Dust cap for tire valves, etc. H. P. Kraft, Ridgewood, New Jersey.

1,492,123 Printer's blanket. A. F. Decker, Pelham, New York.

1,492,148 Inner tube. N. G. Warth, Columbus, Ohio.

1,492,175 Pneumatic tire. R. W. Miller, Wilmington, Delaware.

1,492,218 Inner tube. J. D. Prince, Boston, Massachusetts.

1,492,231 Regulatable cushion truck tire. N. G. Warth, Gallipolis, Ohio.

1,492,256 Metal and rubber bead for tires. H. F. Maranville, assignor by mesne assignments to the Firestone Tire & Rubber Co., both of Akron, Ohio.

1,492,295 Swimming device. W. D. Hart, assignor of one-half to J. H. Whitaker, both of Bloomfield, New Jersey.

1,492,303 Detachable rubber heel. W. A. Maloney, Newton, Massachusetts.

1,492,406 Detachable rubber heel. Louis Tobe, Pittsburgh, Pennsylvania.

1,492,438 Rubber facing disk for automobile wheels. F. Drucken-Mueller, assignor to Rheinische Gummiwarenfabrik Aktien-Gesellschaft Drosselweg 49, both of Coln-Nippes, Germany.

1,492,500 Demountable rim. J. W. White, Lewiston, Montana.

1,492,509 Sectional tire. A. S. Brown, Omaha, Nebraska.

1,492,514 Arch support. F. H. Jensen, Chelsea, Massachusetts.

Issued* May 6, 1924

1,492,773 Eraser attachment for typewriters. J. J. Boyer, Yonkers, N. Y.

1,492,849 Solid tire. A. O. Hubbard, Minneapolis, Minnesota.

1,492,953 Sheet rubber bust-reducing brassiere. L. M. Bender, San Francisco, California.

1,493,048 Swimming belt. P. Mesar, Cleveland, Ohio.

1,493,190 Cushion tire. L. R. Davis, New York, N. Y., assignor to Morgan & Wright, Detroit, Michigan.

1,493,249 Automatic air tester gage and tire tester. A. T. Dewey, Topeka, Kansas.

1,493,298 Dirigible balloon. J. Twardus, Hartford, Connecticut.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Granted April 15, 1924

239,334 Puncture-proof band for tire. J. B. Gould, London, W. 7, England.

239,406 Armored tire. R. von Krenski, Berlin-Friedenau, Germany.

Granted April 29, 1924

239,690 Pneumatic tire. F. L. Rapson, Chertsey, Surrey, England.

239,723 Sheet rubber book cover. The Canadian I. T. S. Rubber Co., Ltd., assignee of O. B. Crowell, both of Toronto, Ontario.

The United Kingdom

Published April 9, 1924

211,211 Rubber-covered horseshoe with rubber frog. A. Preston, 13 Church lane, Sileby, Leicestershire.

211,218 Cushion wheel and tire. E. Kemp, Weston road, West Toronto, Canada.

211,225 Wringing machine roller with rubber sleeve. R. C. Green, Brades Farm, Brayknawt Super-Mangle Co., Ltd., both in Oldbury, Worcestershire.

211,243 Armored tire. A. J. C. Brookes, Lower Faintree, Bridgnorth, Shropshire.

211,321 Rubber-compound paving block. L. Gaisman, Chatham street, Hooley Hill, near Manchester.

211,404 Earpiece for telephonic and other purposes. P. V. Summer, 18 Hanover street, London.

211,421 Inflatable eye, a toy worn like a monocle. A. Peel, 59 New Cavendish street, London.

Published April 16, 1924

211,515 India rubber mats, etc., T. C. Owen and Rowe, White & Co., Ltd., 4 Lloyd's avenue, Fenchurch street, London.

211,602 Rubber sponge doll. M. P. Beach, Ridgefield, Connecticut, U. S. A.

211,607 Rubber arch support. P. Mills, 8 George street, Cardiff.

211,619 Rubber golf mat. T. Whitaker, address in care of Becketts Bank, Bradford.

211,636 Rubber-covered wire rope driving band. J. W. Cann, 16 Chandos street, Charing Cross, London.

211,644 Vulcanized rubber valves. H. S. Hele-Shaw, 64 Victoria street, Westminster, and H. Livsey, Bellevue, Stanley Park road, Carshalton, Surrey.

211,699 Rubber horseshoe pad. J. Bennion, Smithy House, Little Sutton, Cheshire.

211,704 Sole-laying press with sponge rubber back support. T. E. Cann, 18 Applegate street, Leicester.

211,712 Seamless rubber slip-on spat. G. Morris, 53 Croydon road, Erdington, Birmingham.

211,734 Cushion tire. F. A. Wilson, 24 Bina Gardens, and N. A. P. Pneumatic Tyre Co., Ltd. (formerly N. A. P. Pneumatic Tube Tyre Syndicate, Ltd.), Stonhouse street, Clapham, both in London.

Published April 24, 1924

211,902 Inner tube. T. B. McLeroth, 6 Lincoln's Inn Fields, London.

212,057 Air mattresses and cushions. H. Morley, Pinewood, Broad road, Sale, near Manchester.

Published April 30, 1924

212,168 Truss with vulcanite pads. A. Cowie, 8 Dorset street, Glasgow.

212,169 Inflatable swimming costume. E. Funke, 25 Konradstrasse, Zurich, Switzerland.

212,183 Solid tire. C. E. Duck, 62 White Hart Lane, Barnes, London.

Chemical Patents will be found on page 590, Machinery and Process Patents on Pages 593-594

212,202 Cork and rubber disk wheel and tire. H. H. Duke, Moseley, Banksia avenue, Rochdale, Sydney, Australia.

212,203 Cushion tire. M. Harloe, Winchester, Virginia, U. S. A.

212,219 Gaiter. The B. F. Goodrich Co., 1780 Broadway, New York, N. Y., U. S. A.

212,325 Vulcanized rubber device for stretching starched collars to ease them at the fold. R. A. Duran, 19 Cavendish road, Brondesbury, London.

212,336 Crêpe rubber arch support. J. Mason, 82 Cornhill, London.

212,355 Unvulcanized sheet rubber compound lining for acid containers. F. E. Elmore and Chemical & Metallurgical Corporation, Ltd., 701 Salisbury House, London.

212,373 Rubber earpads for telephone receivers. H. G. Wright, 10 Ashgrove Terrace, Gateshead-on-Tyne.

212,378 Golf practice mat of rubber. F. H. Richardson, White Barns, Uphill, Somerset.

212,379 Bottle stopper with rubber packing insert. G. A. Redfern, 15 South street, Finsbury, London.

212,406 Paving block with facing of vulcanized rubber or rubber compound. F. Morton, Pollard street, Milnsbridge, near Huddersfield.

212,437 Cushion tire. H. Wade, 111 Hatton Garden, London.

212,459 Combination dress shield and brassiere. A. E. White, 88 Chancery Lane, London.

212,469 Puncture sealing inner tube. J. Schwab, 434 Stradbrooke avenue, Winnipeg, Canada.

212,503 Armored tire. F. Creassey, 106 Upper Parliament street, Nottingham.

New Zealand

Published March 20, 1924

51,110 Brush. Rubber Brushes, Ltd., 125 High Holborn, London, England.

51,437 Tire. E. B. Killen, 27 Queen Victoria street, London, E. C. 4, England.

Published April 3, 1924

49,743 Milking machine teat cup. W. T. Thompson, of Tariki road, Tariki, and C. J. Twigg, of Lepperton, both in Taranaki.

50,002 Pneumatic support. G. Jordahn, Palm Beach, Florida, U. S. A.

Germany

Design Patents Issued with Dates of Issue

866,157 (February 9, 1924). Bottle fastener for nipples. August Bezler, Sichelstrasse 1, Stuttgart—Cannstätt.

866,178 (February 13, 1924). Maternity belt. Carl Schmid, Corsettfabrik, Hochdorff bei Kirchheim, Württemberg.

866,369 (February 13, 1924). Roller skate with wheels having rubber tires. Karl Walter, Gartenstrasse 105, Heilbronn a. N.

866,457 (February 13, 1924). Pacifier. Joseph Selinger, Masern bei Kempten.

866,460 (February 13, 1924). Rubber covering for dolls. Vulkan Gummiwarenfabrik Weiss & Baessler, A.-G., Leipzig-Lindenau.

866,552 (February 11, 1924). Felt ball with sponge rubber core. Harburger Gummiwaren-Fabrik Phœnix, A.-G., Harburg a-d-Elbe.

866,759 (February 13, 1924). Atomizer. Josef Krämer, Färberstrasse 9, Nürnberg.

866,768 (February 15, 1924). Rubber heel. Rud. Menninger, Oppenheimer Landstrasse 57, Frankfurt-am-Main.

866,976 (February 21, 1924). Exchangeable rubber sleeve with roll edges, as mouthpiece of tobacco pipes. Alfred Jaeckel, Kaiser-Friedrichstrasse 3, Charlottenburg.

867,081 (February 22, 1924). Inflatable cushion seat. C. Müller, Gummiwarenfabrik, A.-G., Berlin-Weissensee.

867,243 (February 19, 1924). Medicine bottle with rubber cap and protective covering. Aesculap-Apotheke, Berlin.

867,399 (February 29, 1924). Toy figure of rubber pieces gummed together. Wilhelm Friedrich Thiele, Springerstrasse 9, Leipzig.

867,482 (February 26, 1924). Bathing sandals. Sachsland Gummiwarenfabrik, Bürgel in Thüringen.

867,555 (February 21, 1924). Protective insert for bicycle tires. Carl Morat, Ueberlingen a. B.

867,594 (February 29, 1924). Nipple. Johann Krämer, Westerode b. Duderstadt.

867,701 (July 19, 1921). Pneumatic tire. The Dunlop Rubber Co., Limited, London; represented by: Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. M. Wirth, Frankfort-am-Main and T. R. Koehnhorn and E. Noll, Berlin, S. W. 11.

867,711 (July 2, 1923). Elastic tire. Sembusto, Elastische Radbereifungen, G. m. b. H., Vienna; represented by: L. Werner and E. Wurm, Berlin S. W. 11.

867,829 (February 12, 1924). Rubber sponge with rubber strip. H. Schwieder, Sächsische Gummi-und-Guttaperchawarenfabrik, Dresden.

867,831 (February 15, 1924). Fastening for rubber heels. Hans Krampmann, Hörde i. W.

867,920 (February 2, 1924). Rubber heel. Hansa G. m. b. H., Munich.

867,922 (February 5, 1924). Tube for rubber solutions. Kohlstock & Hansen, Hamburg.

868,073 (February 28, 1924). Removable rubber heel. Oskar Borkowsky, Altenbochum i. W.

868,363 (February 23, 1923). Packing for nipples. Mitteldeutsche Gummi-und Guttapercha-Industrie. Edelmuth & Co., Frankfurt-am-Main.

868,600 (March 7, 1924). Irrigating syringe. Firma F. L. Fischer, Freiburg i. Br.

868,661 (February 28, 1924). Rubber stocking. Oswald. Ungefroren, Ziegelstrasse 12, Leipzig-Plagwitz.

868,746 (February 23, 1924). Inflatable rubber toy. Continental-Caoutchouc-und Gutta Percha-Compagnie, Hannover.

868,862 (March 3, 1924). Band with raw rubber insert for ladies' apparel. Carl Bibl, Brettgasse 1, Chemnitz.

868,983 (March 8, 1924). Noiseless cogged wheel. Continental Caoutchouc-und Gutta-Percha-Compagnie, Hannover.

Germany

Patents Issued with Dates of Issue

393,766 (August 26, 1921). Pneumatic spring for motor vehicles. Bradford B. Holmes, Washington, D. C. Represented by Dr. G. Breitung, and M. Wagner, Berlin S. W. 11.

393,923 (April 27, 1922). Self-closing rubber valve for football bladders. Albert Peter, Grabenstrasse 18, Essen.

394,290 (February 16, 1921). Valve in which the closing disk of rubber or the like is arranged in a metal capsule. Henry Thomas Hobbs and Henry Morris Parry, London; represented by: Dr. S. Hamburger, Berlin, S. W. 61.

394,449 (December 14, 1922). Bulb syringe. Friederich Conrad Beck, Winterthur, Switzerland; represented by: A. Kuhn, Berlin, S. W. 61.

394,480 (July 5, 1923). Valve for football bladders. Gutkind & Einstein, Nurnberg.

394,621 (January 20, 1921). Reinforcing strips for tires. Sidney Charles Caddy, Kingston-on-Thames, England; represented by: Dr. R. Geissler, Berlin S. W. 11.

394,622 (May 9, 1922). Cellular air chamber for pneumatic tires. T. B. McLeroth (Tubes) Limited, London, represented by F. Schwenterley, Berlin S. W. 11.

395,022 (November 22, 1922). Rubber sole. Heinrich Chormann, Hüttenstrasse 42, Düsseldorf.

395,086 (May 1, 1921). Tube for conducting cooling water. Kühltransit A.-G., Leipzig.

395,102 (August 23, 1922). Inhaler. Noval Chemische Industrie. G. m b. H., Wiesbaden.

395,165 (December 6, 1922). Water bottle with fabric insert. Seamless Rubber Co., Inc., New Haven, Connecticut, United States; represented by: F. Meffert and Dr. L. Lell, Berlin S. W. 68.

395,488 (November 20, 1921). Rubber stopper. Gustav Fuchs, Olbersdorf bei Zittau, Saxony.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted April 15, 1924, Act of February 20, 1905

182,561 TRAFFIK—belting, tires and casings made wholly or partly of rubber. The Federal Rubber Co. of Illinois, Chicago, Illinois.

182,748 MAHOGANITE—panels and dials for radio apparatus. American Hard Rubber Co., Hempstead and New York, N. Y.

182,770 BLAUNER'S "FAIRFOOT," and in small type in lower right corner of the card the word PHILADELPHIA—shoes of leather, rubber, fabric, or combinations of these. Blauner's, Philadelphia, Pa.

Granted April 15, 1924, Act of March 19, 1920, Section 1(b)

182,858 LEXINGTON—rubber tires and tubes. The National Tire & Rubber Co., East Palestine, Ohio.

182,876 RESISTOIL—rubber hose. Brunner Manufacturing Co., Utica, N. Y.

182,895 Within a rhombus the word GLADSTONE, so arranged that the central letter S is the largest and the two end letters the smallest; under this the words; GOOD AS ITS NAME—rubber tires, tubes and casings. Harry D. Gladstone, trading as Gladstone Tyre & Supply Co., New York, N. Y.

Granted April 22, 1924, Act of February 20, 1905

182,987 "O. K." in white letters on a black circular disk at the center of a circle—rubber compound, splicing tape, and black friction adhesive tape. Appleton Rubber Co., Franklin and Boston, Massachusetts.

183,022 CONTÉ—stationers' supplies, including rubber erasers and rubber bands. Societé Anonyme "Crayons Conté," Regny and Paris, France.

183,023 CONTÉ A PARIS—stationers' supplies, including rubber erasers and rubber bands. Societé Anonyme "Crayons Conté," Regny and Paris, France.

183,041 DELLEX—table mats of lace or net inclosing heat insulators, the predominating material being vulcanized plantation rubber. F. F. Dell, London, England.

183,065 VARIOLASTIC—elastic webbing in the piece, suitable for making inserts in corsets, shoe uppers, etc. Kops Brothers, Inc., New York, N. Y.

183,089 PIONEER, within a double-ruled rhombus—game balls and the rubber bladders therefor. The Pioneer Rubber Co., Willard, Ohio.

Granted April 22, 1924, Act of March 19, 1920, Section 1(b)

183,262 THE NEW HUDSON CORD; individual arrangement of the words—rubber tires. Hudson Tire Co., Inc., Newark, New Jersey.

183,267 EVERSTRETCH—narrow elastic. W. B. Bliss, Jr., & Co., assignor to Wm. B. Bliss Jr. & Co., Inc., New York, N. Y.

Granted April 29, 1924, Act of February 20, 1905

183,316 MASSASOIT—tires made wholly or partly of rubber. The Fisk Rubber Co., doing business as Massasoit Rubber Works, Chicopee Falls, Massachusetts.

183,332 SPRI-FOOT—rubber heels. Fitz Chemical Co., Phillipsburgh, New Jersey.

183,338 WEST POINT OFFICER'S HIKER, the word "OFFICER'S" being within an oval outline with WEST POINT above and HIKER below, and the whole enclosed within a double ruled oval border—shoes of leather, rubber, fabric, or combinations of these. Remy-Landsberg Shoe Co., Philadelphia, Pennsylvania.

183,361 ZEV—tires and tubes of rubber, fabric, and combinations of these. The Union Rubber Co., Zelienople, Pennsylvania.

183,368 KENWAY—rubber tires and tubes. C. Kenyon Co., Inc., Brooklyn, N. Y.

183,401 A winged wheel and under it the word SERVUS—rubber and canvas footwear. The Servus Rubber Co., Rock Island, Illinois.

183,407 "LIBERTY" PATCH, within a border somewhat resembling a wall panel—sheet rubber and textile rubber patches. U. S. Distribution Co., Saginaw, Michigan.

183,435 SUBMARINE WATER GUARD, the first word within an outline of a submarine; in smaller type below, "IT FITS BEHIND THE EARS"—bathing caps and waterguards for bathing caps. Lew-Mar Products Co., New York, N. Y.

183,436 The word ALLYNWON written over and almost covering the word MOOD; below this the representation of a coat of arms—corsets, brassieres and abdominal belts. J. M. Bodenseik, New York, N. Y.

183,438 Representation of a shoe, above it the word SURE and below it the word FIT, the toe of the shoe resting on F and the heel on T, with individual border lines—shoes of leather, rubber, fabric, or fabric and rubber. Smaltz-Goodwin Co., Philadelphia, Pennsylvania.

183,440 HAMMER—hose made of rubber and fabric. Ingersoll-Rand Co., Jersey City, New Jersey.

Granted April 29, 1924, Act of March 19, 1920, Section 1(b)

183,512 GARLOCK STYLE NO. 19—packing and packing material made of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

183,513 GARLOCK STYLE NO. 22—packing and packing material made of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

183,514 GARLOCK STYLE NO. 24—packing or packing material made of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

183,515 GARLOCK STYLE NO. 150—packing and packing material, made of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

183,516 GARLOCK STYLE NO. 243—packing or packing material of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

183,517 GARLOCK STYLE NO. 900, the words arranged to describe a circle—packing or packing material of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

183,518 GARLOCK STYLE NO. 901, arranged in three lines—packing or packing material of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

183,519 GARLOCK STYLE NO. 44, arranged in three lines—packing or packing material of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

183,520 GARLOCK STYLE NO. 666, arranged in three lines. Packing or packing materials of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

183,521 GARLOCK STYLE NO. 720, arranged in three lines—packing or packing materials of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

183,532 SAFETY CUSHION—rubber heels. O'Sullivan Rubber Co., Inc., New York, N. Y.

183,550 GARLOCK STYLE NO. 17—packing or packing materials of or containing rubber. The Garlock Packing Co., Palmyra, N. Y.

Granted May 6, 1924, Act of February 20, 1905

183,564 VULCALYNE—composition for metal-coating rubber. Vulcalyne Co., Los Angeles, California.

183,726 LIFE LINE, with a short length of rope looped around and in back of the letters—elastic webbing. Ivory Garter Co., New Orleans, Louisiana.

183,727 MUSCLE, and back of the word the representation of an arm and clenched fist—elastic webbing. Ivory Garter Co., New Orleans, Louisiana.

183,741 TAURUS—soles and heels of leather or caoutchouc. Hungarian Rubber Goods Factory, Ltd., Budapest, Hungary.

183,772 SURGEX—surgeons' rubber gloves. J. V. Miller, trading as Miller Glove Co., Massillon, Ohio.

183,823 AIROTANK—pneumatic tires and tubes. Ora Krichbaum, doing business as K & W Rubber Co., Delaware, Ohio.

183,826 FIT-FORM—hot water bags and bottles. Sampson-Martin Corporation, New York, N. Y.

183,862 BROADCAST—shoes, rubbers, overshoes, etc., made of leather, rubber, fabric, or combinations of these. G. E. Pierce, trading as Thomas F. Pierce & Son, Providence, Rhode Island.

Granted May 6, 1924, Act of March 19, 1920, Section 1(b)

183,900 FLASH, with jagged lines representing lightning on either side—rubber soles and heels. P. Barbieri, Perth Amboy, New Jersey.

The Dominion of Canada

Registered

35,376 PLUS-FOURS—pads made of or containing rubber, for application to boots and shoes. Blakey's Boot Protectors, Ltd., Armley Malleable Ironworks, Modder Place, Armley, Leeds, Yorkshire, England.

35,448 The word "AIRCORE" associated with the words KELLY SPRINGFIELD appearing over the tail of the letter A in AIRCORE—tires made wholly or in part of rubber. Kelly-Springfield Tire Co., New York, N. Y.

35,459 CONCAVEX—heels, tips, soles, and pads for boots and shoes, all of rubber. I. T. S. Rubber Co., Ltd., 42 Great Russell street, London, England.

The United Kingdom

Published April 9, 1924

434,065 Representation of a winged wheel and above it the words THE "AERIAL," the whole inclosed within an oval border—rubber balls for games. The Clayton Rubber Co., Ltd., Progress Works, Croft street, Manchester, Lancashire.

B440,061 HOOD RUBBER COMPANY, BOSTON, the words underlined and arranged in three lines and inclosed in an oval outline—boots and shoes of rubber, or of canvas and rubber. Hood Rubber Co., Watertown, Massachusetts, U. S. A.

444,093 CONCAVEX—rubber heels, tips, soles and pads. I. T. S. Rubber Co., Ltd., 42 Great Russell street, London, W. C. 1.

445,341 ARISTON—vulcanized rubber combs for the hair. Deutsches Gummi-Kamm Werk mit Beschränkter Haftung, Berlin, Germany.

Published April 16, 1924

445,354 RUBLATA—all goods in Class 40 except golf club grips or similar articles. Boston Woven Hose & Rubber Co., Hampshire and Portland streets, Boston, Massachusetts, U. S. A.

B445,508 PALMA—steam and hydraulic high pressure packings. W. Jesseman & Co., Ltd., 157 Commercial street, Newport, Monmouthshire.

Published April 23, 1924

B440,413 FLEET FOOT—footwear with rubber soles and canvas uppers. United States Rubber Co., Ltd., 47-48 Farringdon street, London, E. C. 4.

444,811 Within a parallelogram the words: NORTH BRITISH TRITRED TYRE, and below this the representation of a scale balanced on the point of a spear, within the annular space of the double-ruled circular border of this the firm name and address—tires. The North British Rubber Co., Ltd., Castle Mills, Fountainbridge, Edinburgh, Scotland.

444,812 Representation of a lion rampant, beneath one paw the cross-section of a tire with the words AIR SPRUNG, this being on top of a pile of three tires—tires and parts thereof included in Class 40. The North British Rubber Co., Ltd., Castle Mills, Fountainbridge, Edinburgh, Scotland.

446,424 MAELSTROM—raincoats. Paisley's Limited, 82 Jamaica street, Glasgow.

Published April 30, 1924

B434,108 PREMIER—footballs. Barrow Hepburn & Gale, Ltd., 47 Weston street, London, S. E. 1.

445,643 CARBOTEX—India rubber partly prepared and reclaimed rubber in Class 4. Northwestern Rubber Co. (an American corporation registered under the laws of West Virginia, U. S. A.), Canal Works, Hawthorne Road, Litherland, Liverpool, and Second National Buildings, Akron, Ohio.

446,286 "CROXITE"—vulcanite goods exclusively in Class 40. Croxsonio Co., 10 South street, London, E. C. 2 and 27 Bermondsey street, London.

New Zealand

Registered

16,922 FEDERAL—tires and tubes for automobiles and for motorcycles. The Federal Rubber Co., Cudahy, Wisconsin, U. S. A.

20,021 PAX—rubber heels. G. Pirrit, 100-102 Victoria street, Auckland.

B20,294 OLDFIELD—tires and tubes of rubber or rubber and fabric. The Oldfield Tire Co., Akron, Ohio, U. S. A.

20,999 SECURITAS, the initial and the final S being joined by an overstroke—rubber teats, soothers, enemas and finger stalls. O. A. C. Martin, trading as Charles Martin & Co., 3 Tooks Court, Furnival street, Holborn, London, E. C. 4, England.

Designs

The United States

Issued* April 15, 1924

64,455 Tire. Term 14 years. H. Hoffstaedter, New York, N. Y.

64,461 Non-skid tire. Term 14 years. G. D. Kratz and C. Wattleworth, Akron, assignors to The Falls Rubber Co., Cuyahoga Falls, all in Ohio.

64,462. Tire. Term 7 years. G. D. Kratz and C. Wattleworth, Akron, assignors to The Falls Rubber Co., Cuyahoga Falls, all in Ohio.

64,455 64,461 64,462 64,485 64,486 64,562 64,574

64,485 Tire. Term 14 years. Paul Worth, Akron, assignor to The India Tire & Rubber Co., Mogadore, both in Ohio.

64,486 Tire. Term 14 years. Paul Worth, Akron, assignor to The India Tire & Rubber Co., Mogadore, both in Ohio.

Issued* April 22, 1924

64,494 Rubber heel. Term 14 years. W. H. Cary, Brockton, Mass.

Issued* April 29, 1924

64,534 Ball. Term 14 years. A. J. Eldon, Montclair, assignor to Paramount Rubber Consolidated, Inc., Little Falls, both in New Jersey.

64,535 Ball. Term 14 years. A. J. Eldon, Montclair, assignor to Paramount Rubber Consolidated, Inc., Little Falls, both in New Jersey.

64,562 Tire. Term 14 years. S. B. Robertson, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

64,574 Tire tread. Term 7 years. J. B. White, Spokane, Washington.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Registered

6,168 Overshoes or galoshes. Kaufman Rubber Co., Ltd., Kitchener, Ontario.

6,171 Overshoes or galoshes. Kaufman Rubber Co., Ltd., Kitchener, Ontario.

6,172 Overshoes or galoshes. Kaufman Rubber Co., Ltd., Kitchener, Ontario.

6,173 Overshoes or galoshes. Kaufman Rubber Co., Ltd., Kitchener, Ontario.

6,174 Overshoes or galoshes. Kaufman Rubber Co., Ltd., Kitchener, Ontario.

6,183 Solid tire tread. E. B. Germain, Buffalo, New York.

TIRE AND RIM ASSOCIATION REPORT OF RIMS INSPECTED AND APPROVED DURING APRIL, 1924

Size	Number	Per Cent
Clincher Rims:		
26 x 3	5,200	0.2
28 x 3	6,140	0.3
30 x 3	70,381	3.0
30 x 3½	1,081,945	45.7
31 x 4	63,177	2.7
Straightside:		
27 x 3½	582	0.0
28 x 3½	204,246	8.6
29 x 3½	6,250	0.3
30 x 3½	300,217	12.7
32 x 3½	11,480	0.5
28 x 4	81,024	3.4
29 x 4	87,615	3.7
30 x 4	4,706	0.2
31 x 4	10,303	0.5
32 x 4	163,095	6.9
33 x 4	7,476	0.3
29 x 4½	65,111	2.3
30 x 4½	26,719	1.2
31 x 4½	267	0.0
32 x 4½	117,155	5.0
34 x 4½	29,544	1.2
30 x 5	1,302	0.1
31 x 5	251	0.0
33 x 6	2,145	0.1
Truck:		
30 x 5	1,321	0.1
34 x 5	15,875	0.7
32 x 6	1,505	0.1
36 x 6	4,695	0.2
34 x 7	251	0.0
38 x 7	716	0.0
Total	2,370,694	100.0

COMPARATIVE RIM PRODUCTION FOR BALLOON AND HIGH PRESSURE TIRES

RIM SIZES USED FOR BALLOON TIRES

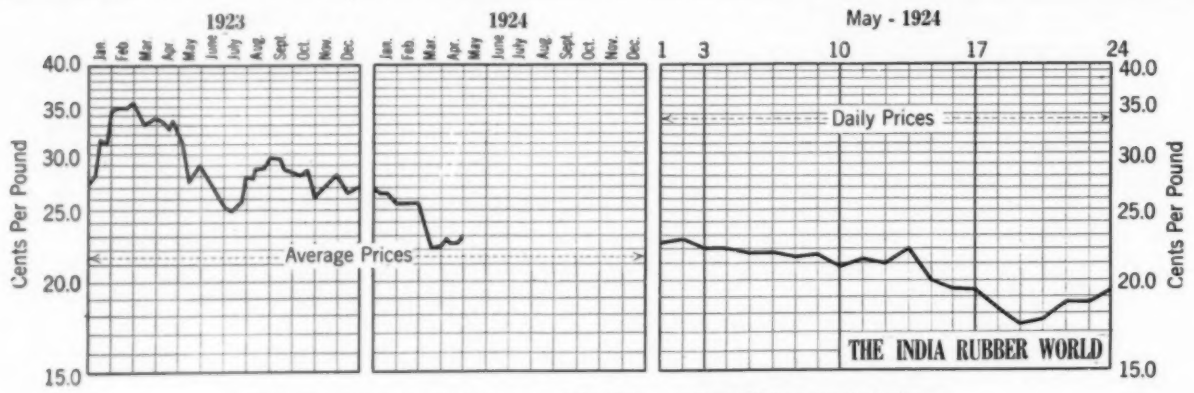
Size	Balloon Rim Size	Mar., 1924		Feb., 1924		Jan., 1924		Dec., 1923		Nov., 1923		Oct., 1923		Sept., 1923	
		Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
(27x3½)	20x3½	.....	....	289	0.0	456	0.0	101	0.0	10,397	0.5	6,991	0.3	3,648	0.2
(28x3½)	21x3½	128,153	4.9	75,910	3.3	17,460	0.7	13,977	0.7	93	0.0	.....	...	.....	...
(28x4)	20x4	65,502	2.5	58,870	2.5	13,803	0.6	7,654	0.3	3,958	0.2	2,829	0.1	1,053	0.1
(29x4)	21x4	113,810	4.3	43,480	1.9	20,590	0.9	.....	...	2,126	0.1	.....	...	.....	...
(30x4)	22x4	32	0.0	550	0.0	143	0.0	.....	...	.....	...	41	0.0	.....	...
(29x4½)	20x4½	46,219	1.8	40,493	1.7	20,190	0.8	4,776	0.2	7,533	0.4	6,228	0.3	10,925	0.7
(30x4½)	21x4½	8,322	0.3	7,768	0.3	690	0.0	433	0.0	.....	...	45	0.0	.....	...
(31x4½)	22x4½	50	0.0	624	0.0	722	0.0	25	0.0	.....	...	42	0.0	.....	...
(30x5)	20x5	10,459	0.4	4,409	0.2	987	0.0	1,066	0.0	270	0.0	335	0.0	877	0.1
Total		372,547	14.2	232,393	9.9	75,041	3.0	28,032	1.2	24,377	1.2	16,511	0.7	16,503	1.1

RIM SIZES USED FOR HIGH PRESSURE TIRES

Size	Mar., 1924		Feb., 1924		Jan., 1924		Dec., 1923		Nov., 1923		Oct., 1923		Sept., 1923	
	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
30x3½*	1,067,574	41.8	833,081	36.5	1,082,463	46.9	886,945	50.3	859,298	47.7	905,695	45.9	793,214	50.1
30x3½	460,792	17.6	465,744	20.3	410,123	17.8	277,809	15.7	337,765	18.7	267,208	13.5	188,266	11.9
32x3½	6,980	0.3	12,002	0.5	6,874	0.3	1,246	0.0	9,974	0.5	21,951	1.1	8,608	0.5
31x4*	167,077	6.4	216,217	9.4	136,692	5.9	156,839	8.9	87,016	4.8	172,128	8.7	160,179	10.2
31x4	575	0.0	5,773	0.2	3,907	0.1	8,016	0.4	1,322	0.0	342	0.0	9,057	0.6
32x4	201,334	7.9	268,308	11.7	260,989	11.3	163,523	9.2	190,765	10.5	270,375	13.7	186,545	11.8
33x4	38,685	1.5	19,291	0.8	17,074	0.7	5,396	0.3	17,044	0.8	18,248	0.9	15,239	1.0
34x4	500	0.0	.....	...	.....	...	180	0.0	1,067	0.0	3,714	0.1	578	0.0
29x4½	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...
31x4½	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...
32x4½	160,658	6.3	140,215	6.1	223,737	0.9	73,978	4.1	127,999	7.1	134,803	6.8	94,330	6.0
33x4½	.....	...	990	0.0	.....	...	.....	...	81	0.0	530	0.0	.....	...
34x4½	36,993	1.4	29,836	1.3	46,112	1.9	32,301	1.8	20,144	1.1	17,716	0.9	34,129	2.2
36x4½	.....	...	165	0.0	483	0.0	308	0.0	1,032	0.0	879	0.0	1,347	0.1
Total	2,141,168	83.2	1,991,622	86.8	2,188,454	85.8	1,606,351	90.7	1,654,227	91.2	1,813,589	91.6	1,491,492	94.4

*Clincher.

Compiled by the Tire & Rim Association of America, Inc.



Ratio Graph of New York Average Sales Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

PLANTATION spot-rubber prices in May were generally weak in the absence of buying support, declining continuously from 22½ cents on May 1 to 21 cents the middle of the month. At that time the price rallied for a day to 22 cents and in less than a week from that event fell to 17⅜ cents, on May 20.

Reviewing the May market by weeks, prices held steady just previous to May 1 in expectation that announcement would be made, under the Stevenson plan, of a reduction of exportable allowances for the second quarter. London cables and the fact that the Stevenson Committee did not cut the exportable percentage renewed the gradual decline of prices on both spot and future deliveries. First latex crêpe sold at a premium of 1 to 1½ cents premium over ribs.

On the decline during the first full week in May the market was very dull. There was some factory buying and some July-September rubber was bought between factories at 21 cents. Manufacturers bought only for actual manufacturing needs, as has been their policy for a considerable time past. Very little July-September or July-December business was placed.

Immediately following the middle of the month spot prices again fell two cents, reaching 17⅜ cents, the lowest level since October, 1922. The market was very depressed and sellers greatly outnumbered buyers. The cause assigned for the drop was that the British Government declined to interfere with restrictions, and that causes beyond control of restriction, such as smuggling into Malaya and lack of consuming demand, had run world stocks up to a tonnage beyond reasonable needs.

Parás were lower in sympathy with plantation grades and yet Upriver fine held fairly steady, due to actual shortage of spot supplies during the week ending May 17. Balatas and other grades were neglected.

Importations of all grades during April, 1924, were 42,436 tons, compared with 31,588 tons one year ago. Plantation arrivals for April, 1924, were 41,438 tons, compared with 29,922 tons one year ago. Total importations of all grades for the four months ended April 30, were 113,562 tons compared with 120,921 tons for the corresponding period of last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATION. May 1. Spot first latex crêpe, 23¼-23⅜ cents; May, 23¼-23⅜ cents; June-July, 23⅜-23½ cents; July-Sept., 23½-23⅝ cents; Oct.-Dec., 23½-23¾ cents.

May 24. Spot first latex crêpe, 19¾-20 cents; June-July, 20½ cents; July-Sept., 20½ cents; Oct.-Dec., 21 cents.

May 1. Spot ribbed smoked sheets, 22½-22⅝ cents; May, 22½-22⅝ cents; June-July, 22⅝-22⅞ cents; July-Sept., 22¾-23 cents; Oct.-Dec., 23¼-23½ cents.

May 24. Spot ribbed smoked sheets, 19¼ cents; June-July, 19⅛ cents; July-Sept., 19¾ cents; Oct.-Dec. 20 cents.

May 1. Spot No. 2 amber crêpe, 22½ cents; May 22½ cents; June-July, 22⅝-22¾ cents; July-Sept., 22⅞-23 cents; Oct.-Dec., 23-23¼ cents.

May 24. Spot No. 2 amber crêpe, 18¾ cents; June-July, 18¾ cents; July-Sept. 19 cents; Oct.-Dec. 19¼ cents.

May 1. Spot No. 1 rolled brown crêpe, 21½-21⅝ cents; May 21½-21⅝ cents; June-July 21⅝-21¾ cents; July-Sept. 22-22¼ cents; Oct.Dec., 22¼-22½ cents.

May 24. Spot No. 1 rolled brown crêpe, 17¾-18 cents; June-July, 18¼ cents; July-Sept. 18½ cents; Oct.-Dec., 18¾ cents.

SOUTH AMERICAN PARAS AND CAUCHO. May 1. Spot, upriver fine, 20¾-21½ cents; island fine 16½ cents; upriver coarse, 16 cents; island coarse, 11½ cents; Cametá 11½ cents; caucho ball, 16 cents.

May 24. Spot, upriver fine, 19-19½ cents; island fine, 18 cents; upriver coarse, 13½-13¾ cents; Cametá, 11½ cents; caucho ball, 12-13¼ cents.

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

PLANTATIONS	April, 1924														May, 1924								
	14	15	16	17	18*	19**	21	22	23	24	25	26	28	29	30	1	2	3	5	6	7	8	9	10
Sheet																								
Ribbed smoked	22⅛	22¼	22⅛	22¼	....	22¼	22½	22⅝	23	23	23⅛	23⅛	23	22⅞	22⅝	22⅝	21⅞	22	21¾	21⅝	21½	21	21	21⅛
Crêpe																								
First latex	22⅞	22¾	22⅝	22¾	....	22¾	23	23⅛	23⅞	23¾	23⅞	23¾	23¾	23½	23⅜	23¼	22⅝	22⅝	22⅝	22⅝	22¼	21⅝	21¾	21⅞
Off latex	22⅛	22⅛	22½	22⅛	....	22⅛	22¼	23	23⅛	23⅛	23¼	23⅛	23¼	23⅛	23	22⅞	22¼	22⅛	21⅞	21¾	21⅞	21⅛	21⅛	21⅛
No. 1 blanket																						21		
No. 2 blanket	21⅞	21¾	21¾	21⅞	....	21⅞	21⅞	22	22⅛	22¼	22⅜	22⅜	22½	22⅜	22	21⅞	21⅛	21½	21¼	21¼	21	20⅜	20⅜	20⅛
No. 3 blanket	21¼	21⅛	21⅛	21⅛	....	21⅛	21⅛	21¼	22⅛	22⅛	22¼	22¼	22⅛	22	21⅞	21½	21⅛	21¼	20¾	20¾	20½	20	20⅛	20⅛
Thin, clean brown	21⅜	21⅜	21½	21⅜	....	21⅜	21⅜	22	22⅛	22⅛	22½	22½	22¼	22⅛	21⅜	21¼	21¼	21¼	21	20¾	20⅜	20⅛	20¼	20¼
Specky brown	21½	21⅜	21¼	21¼	....	21¼	21½	21⅝	21¾	21⅞	21⅜	22	21⅞	21¾	21¾	21½	20¾	21	20⅛	20½	20¼	19½	20	20
Rolled brown	21⅝	21⅜	21¼	21⅜	....	21¼	21½	21¾	22	21⅞	21¼	21⅛	21⅜	21⅝	21½	21¼	20½	21¼	20⅛	20	19¾	19⅜	19¼	19¼

*Trade closed.

**Brokers furnishing prices to us have suggested that we use Thursday's prices. Market practically closed. Prices for the 19th, therefore, are more or less nominal.

New York Quotations

Following are the New York spot rubber quotations per pound, for one year, one month ago, and May 24, the current date:

Plantation Hevea	May 25, 1923	April 25, 1924	May 24, 1924
LATEX			
Rubber latex (Hevea) *per gal.*	$1.25@$1.35 *per gal.*	$1.30@ *per gal.*	$1.25@
CREPE			
First latex	.29 @	.24 @	.19¾@.20
Off latex	.28¾ @	.23½ @	.19 @
Amber No. 1	.28½ @	@	@
Amber No. 2	.28 @	.22¾ @	.18¾ @
Amber No. 3	.27½ @	.22½ @	.18¼ @
Brown, clean, thin	.27½@.27¾	.22½ @	.18¼ @
Brown, specky	.27½ @	.21½ @	.18 @
Brown, roll	.26½ @	.21⅝ @	.17¾@.18
Sole crêpe	@	@	.45 @.48
SHEET			
Smoked, ribbed	.29 @	.23 @	.19¼@.19⅜
Smoked, plain	.27⅝ @	@	@
Unsmoked	.27 @	@	@
East Indian			
PONTIANAK			
Banjermassin	.08 @	.07¼ @	@
Palembang	.08½@.08¾	.07½ @	@
Pressed Block	.13¼@.13½	.13 @	@
Sarawak	.07 @.07½	.07 @	.06¾ @
South American			
PARAS			
Upriver, fine	.28 @	.20¾ @	.19 @.19⅛
Upriver, fine	*.38¾ @	*.29 @	*.25¼ @
Upriver, medium	.25½ @	.18 @	.17½@.18
Upriver, coarse	.25 @	.16 @.16¼	.13¼@.13¾
Upriver, coarse	*.36 @	*.25 @	*.22½ @
Islands, fine	.26 @	.16½@.17	.18 @
Islands, medium	.24¼@	.17¼@	.16 @
Islands, coarse	.14¾@	.11½@	.11¼@
Cametá	.15 @	.12 @	.11½@
Acre Bolivian, fine	.27½@	.20¾@	.19½@
Acre Bolivian, fine	*.39 @	*.29 @	*.25½@
Beni Bolivian	.27½@	.20¾@	.20 @
Madeira, fine	.27½@	.21½@	.21 @
Peruvian, fine	†.26 @	.19¾@	.18 @.18½
Tapajos, fine	.26 @	.19 @.19¾	.18 @.18½
CAUCHO			
Upper caucho ball	.26½@	@	.13 @.13¾
Upper caucho ball	*.37 @	*.26 @	*.22½@
Lower caucho ball	.25¾@	@	.12 @.12¼
Maniçobas			
Ceará negro heads	.22 @	.19 @	.19 @
Ceará scrap	.09 @	.08 @	.08 @
Maniçoba 30% guaranty	.23 @	.16 @	.16 @
Mangabeira, thin sheet	.24 @	.21 @	.20 @
Centrals			
Central scrap	.21¾@.22	.16 @	@
Central wet sheet	.17 @.19	.14 @	@
Corinto scrap	.21¾@.22	.16 @	@
Esmeralda sausage	.21¾@.22	.16 @	@
Guayule washed and dried	.28 @	.24 @	.23 @
Africans			
Benguela, No. 1, 28½%..	@	.16 @	@
Benguela, No. 2, 32½%..	.14 @.15	.12 @	†.12 @
Congo prime, black upper	.24 @.25	.19 @	†.17 @
Congo prime, red upper	.21 @.23	.20 @	†.18 @
Kassai, black	.23 @.24	.18 @	†.17 @
Kassai, red	.20 @.21	.19 @	†.19 @
Gutta Percha			
Gutta Siak	.19 @.19¾	.16 @.17	.16¼@
Gutta Soh	@	.29 @	.28 @
Red Macassar	2.90 @3.00	3.00 @	3.00 @
Balata			
Block, Ciudad Bolivar	.72 @.74	.65 @.66	.62 @
Columbia	.58 @.60	.59 @.60	.53 @
Panama	.58 @.60	.59 @.60	.53 @
Surinam, sheet	.80 @.83	.74 @	.70 @
amber	.83 @.85	.76 @	.74 @
Chicle			
Colombia	.25 @	†.31 @	@
Honduras	.62 @	†.64 @.65	.58 @.68
Venezuela	.63 @	†.66 @	@
Yucatan, fine	.65 @	†.67 @.67½	.58 @.68

*Washed and dried crêpe. Shipment from Brazil.
†Nominal.

London

London crude rubber market was generally dull, weak and declining for the most part for the first three weeks of May. The decline began May 1, due to heavy liquidation and the decision of the Stevenson Committee to allow the exportable figure on plantation rubber to remain unchanged for the second quarter. In protest against this action on restriction a cabled petition was sent to the Colonial Office from a sub-committee of the Rubber Growers' Association, asking for either an immediate revision of the present restriction scheme or the adoption of another "designed to accomplish for the rubber growers what the Stevenson Act has failed to do."

Pending reply to the petition the large selling interests withdrew from the market, which became dull and depressed, declining steadily to 9⅞ pence May 20. The decline was due to general weakness and lack of buying interest accentuated by the action of the large sellers, who resumed liquidating without reserve on a report that the government had declined to interfere in the restriction situation or take any steps toward strengthening or reforming the present Stevenson plan in any way. News from American manufacturers was also very depressing although prices reacted from the low point and became firmer, responding to the American and continental demand which appeared. On May 24 the tone was very firm with most sellers withdrawn from the London market.

Reported London stocks decreased 1,322 tons between April 22 and May 20. The weekly stocks were as follows: April 29, 54,165 tons; May 6, 54,438 tons; May 13, 54,546 tons; May 20, 53,045 tons.

Comparative Low and High New York Spot Rubber Prices

	May 1924*	May 1923	May 1922
PLANTATIONS			
First latex crêpe	$0.18 @$0.23¾	$0.26¼@$0.32	$0.14¼@$0.16½
Smoked sheet, ribbed	.18⅝@ .22⅝	.26½@ .32	.14½@ .16½
PARAS			
Upriver, fine	.18½@ .21½	.26 @ .28	.18 @ .18¾
Upriver, coarse	.13¼@ .16½	.21½@ .25½	.12½@ .13¾
Islands, fine	.15½@ .18	.23½@ .26	.17 @ .18¼
Islands, coarse	.11 @ .11½	.14 @ .23	.08½@
Cametá	.10½@ .11½	.14 @ .15¼	.09 @ .09¾

*Figured to May 24, 1924

Reclaimed Rubber

The reclaimed rubber trade has slackened in output and marked down prices on all grades because of decreased demand and hand to mouth purchasing policy of consumers. Attention is called to the fact that reclaimers are now in the strategic position where they have already discounted the current temporary fall in market values owing to the exceptional volume cost of their standard grades.

Rubber manufacturers will hardly be misled by low priced crude rubber into ignoring the value of reclaims as plasticators for reducing mixing time and milling costs. These factors together with their well-known inherent characteristics render them invaluable in manufacturing practice, since as rubber ingredients they cannot be duplicated in volume cost and technical quality by direct compounding.

Business is less in volume and current quotations on standard grades are lower in nearly every instance than a month ago. Reclaiming plants are averaging about half of their capacity output. In the first quarter of this year the production of reclaims totaled 21,836 tons.

New York Quotations

May 24, 1924

Auto Tire		
Black	lb.	$0.08½@$0.08¾
Black, washed	lb.	.10 @ .10½
Dark gray	lb.	.09½@ .09¾
Light gray	lb.	.11 ¾ .11¼
White	lb.	.13¼@ .13¾
Shoe		
Unwashed	lb.	.09 @ .09¼
Washed	lb.	.12½@ .12¾
Tube		
No. 1	lb.	.14 @ .14¼
No. 2	lb.	.10½@ .10¾
Uncured Tire Friction		
No. 1	lb.	.18½@ .19
No 2	lb.	.14 @ .15
Miscellaneous		
High grade, red	lb.	$0.13 @$0.13¼
High tensile, black	lb.	.14½@ .15
Mechanical blends	lb.	.05 @ .06
Truck tire	lb.	.07¼@ .08

The Market for Rubber Scrap

New York

The market during May declined in activity over that of the preceding month. All grades of rubber scrap are abundant and quoted generally at lower levels.

There is very little movement of stocks to reclaiming centers. This is attributed to decline in the price of crude rubber and curtailment in automobile tire production as affecting the operations of reclaimer and rubber scrap dealer alike.

The price of crude rubber has probably less influence than the fact that reclaimers are amply supplied with stocks of scrap for some time to come at their present average rate of output. Scrap consumed by reclaimers during the first quarter of 1924 totaled 28,043 tons, much of which was on hand. Scrap dealers are at present warehousing their purchases from collectors in anticipation of reclaimers' future needs.

BOOTS AND SHOES. Business in boots and shoes is stagnant and reclaimers' orders are filled.

MIXED TIRES. Mixed tires are quiet in the East and very lightly in demand in the West.

INNER TUBES. There has been but little domestic business. A small amount of export business was done.

Consumers' Quotations for Carload Lots Delivered

May 24, 1924

Boots and Shoes		
Boots and shoes, black	lb.	$0.02¼@$0.02½
Trimmed arctics	lb.	.01½@ .01¾
Untrimmed arctics	lb.	.01 @ .01¼
Hard Rubber		
Battery jars, black compound	lb.	.01 @ .01¼
No. 1 scrap	lb.	.05 @ .06
Inner Tubes		
No. 1	lb.	.03½@ .03¾
No. 2	lb.	.02½@ .02¾
Red	lb.	.02⅜@ .02⅝
Mechanicals		
Black scrap, mixed	lb.	.00¾@ —
Heels	lb.	.00½@ —
Horse-shoe pads	lb.	.01 @ —
Hose, air brake	ton	13.00 @15.00
regular	ton	10.00 @12.00
Red, scrap, mixed	lb.	.01½@ .01¾
White, scrap, mixed	lb.	.01½@ .01¾
Tires		
PNEUMATIC		
Auto peelings	lb.	.01 @ .01¼
Bicycle	ton	10.00 @12.00
Standard white autos, with beads	ton	25.00 @28.00
Mixed autos, with beads	ton	12.00 @13.00
Stripped, unguaranteed, with beads	ton	10.00 @10.50
SOLID		
Carriage	ton	20.00 @22.00
Irony	ton	10.00 @13.00
Truck, clean	ton	19.00 @21.00

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	March, 1923		March, 1924	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free*				
Crude rubber				
From France	621,007	$157,190	118,380	$25,356
Netherlands	653,871	202,745	221,208	63,971
Portugal	.....	.....	.....	.....
United Kingdom	11,817,077	3,969,470	5,751,791	1,464,450
Canada	.....	.....	744	249
Central America	5,616	1,186	8,608	855
Mexico	56,010	11,202	.....	.....
Brazil	2,714,687	720,803	2,085,778	419,147
Peru	671,000	80,926	29,328	5,076
Other So. America	90,349	26,010	59,167	13,539
British E. Indies	44,879,669	12,033,735	25,501,667	6,376,226
Dutch E. Indies	6,747,211	1,612,395	10,935,210	2,909,318
Other countries	1,024,209	225,903	1,722,595	359,875
Totals	69,280,706	$19,041,565	46,434,476	$11,638,062
Balata	159,317	110,406	40,689	26,495
Jelutong (Pontianak)	1,268,591	110,486	875,182	63,941
Gutta percha	195,289	47,826	481,124	65,078
Guayule	.....	.....	100,000	20,809
Rubber scrap	2,209,752	131,417	909,769	28,217
Totals	73,113,655	$19,441,700	48,841,240	$11,842,602
Chicle *dutiable*	1,528,429	763,056	1,076,388	579,499
MANUFACTURED—*dutiable*				
Rubber belting	79,440	$59,238	46,555	$31,564
Other manufactures of substitutes for rubber	.....	98,553	.....	294,559
Totals	79,440	$157,791	46,555	$326,123

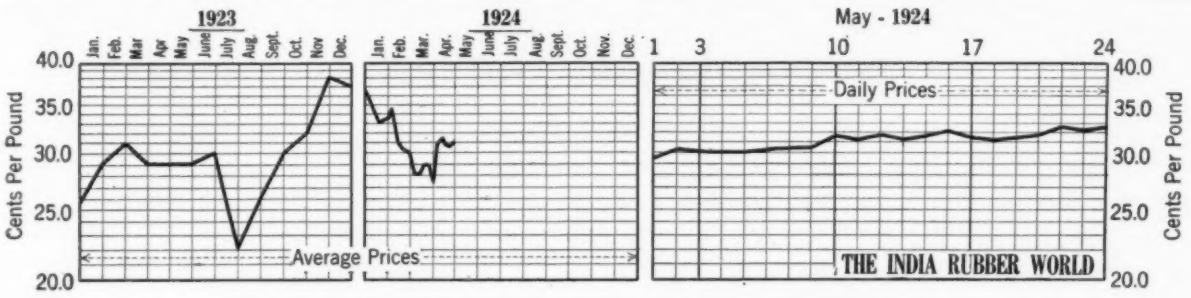
Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	445,453	$43,683	552,484	$58,314
Scrap and old	1,743,763	72,388	1,748,196	74,559
Footwear				
Boots *pairs*	20,990	62,419	19,628	55,088
Shoes *pairs*	57,942	47,675	47,272	38,858
Canvas shoes with rubber soles *pairs*	598,928	449,472	494,019	378,577
Druggists' rubber sundries	85,896	75,611	.....	.....
Water bottles and fountain syringes *number*	.....	.....	11,272	8,466
Other druggists' rubber sundries	.....	.....	53,842	63,519
Bathing caps *dozen*	.....	.....	29,403	49,281
Hard rubber goods				
Battery jars and accessories	29,544	10,227	59,518	14,711
Other electrical supplies	110,636	23,983	15,250	10,727
Other hard rubber goods	42,435	34,811	40,445	52,726
Tires				
Pneumatic casings				
for automobiles *number*	190,468	2,017,424	102,240	1,154,201
Others *number*	8,881	35,899	4,648	21,382
Pneumatic tubes				
For automobiles *number*	134,141	221,429	97,338	161,636
Others *number*	9,389	7,347	2,689	3,125
Solid tires				
For automobiles and motor trucks *number*	10,576	257,251	11,247	285,975
Others	180,078	38,958	117,857	28,304
Tire repair materials	77,309	33,988	85,818	37,600
Belting	333,497	168,411	311,758	181,005
Hose	467,846	181,259	390,010	155,053
Packing	115,327	59,934	173,069	76,004
Soles and heels	199,720	68,806	221,845	72,116
Thread	79,788	81,837	90,736	97,524
Other rubber manufactures	549,297	323,364	401,458	206,723
Totals	.....	$4,316,176	.....	$3,285,465

Exports of Foreign Merchandise

UNMANUFACTURED				
India rubber	2,481,397	$754,590	2,416,963	$622,727
Balata	31,476	21,533	26,698	18,055
Jelutong (Pontianak)	.....	.....	.....	.....
Totals	2,512,873	$776,123	2,443,661	$640,782
MANUFACTURED				
Gutta percha and India rubber	152	$214	3,334	$1,384
India rubber substitutes	.....	.....	70	10
Totals	152	$214	3,404	$1,394

Details of exports of domestic merchandise by countries during March, 1924, appear on pages 632-635 of this issue.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. The price of spot middling upland cotton on May 1 was 29.80 cents and on May 24 was 32.70. Reports from the South show a favorable opinion of the new crop start. The season's first government crop report is due June 2. Census figures show a higher rate of consumption than was expected considering the current reports of general mill curtailment. The export rate indicates an excess of 1,000,000 bales by the end of the season over those of last year.

ARIZONA COTTON. Arizona cotton is becoming scarce, the better grades being worth 42 to 45 cents. Stocks, as of April 30 are reported as 23,114 bales.

EGYPTIAN COTTON. Business in staple cottons is reported extremely dull and price changes unimportant. Stocks of Egyptian cotton in the United States are rapidly diminishing both through consumption and export, while the demand, owing to the high basis, is practically absent. Domestic mills are buying premium staples only in hand-to-month manner at very little advance in price. Extra staples of all lengths and grades are extremely dull and largely nominal in price.

Prices of medium Sakellaridis and Medium Uppers are quoted at 43½ cents and 43⅝ cents, respectively, c. i. f. Boston.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. The market is showing recovery of demand due to belief that goods are becoming scarce through the curtailment of production by the mills, the growing world scarcity of cotton and consequent high prices. A sharp demand for goods is looked for in early Summer, which will meet with a market that has been reduced in supplies and prices enhanced.

RAINCOAT FABRICS. Business in raincoat fabrics is not only dull but actually deplorable in its inactivity. The prevalence of rains throughout the country during the entire Spring passed without stimulating the trade appreciably because of ample stocks in retailers' hands. In this, as in all other lines, cautious buying rules. Quotations remain unchanged from those of a month ago although prices have strengthened to some extent.

SHEETINGS. The volume of business is light and demand moderate. Prices are now higher and firmer than early in the month. Curtailment of mill production is increasing with lessened inquiry for goods.

TIRE FABRICS. Business is very spotty. Instead of buying new commitments tire companies are deferring deliveries. They exhibit little interest concerning supplies for the third quarterly requirements. The automobile and tributory industries are passing a period of deflation in stocks; consequently the response of tire manufacturers to solicitation for new fabric business is disappointing.

Fabric mills with orders are operating their looms at fractional capacity to fill orders for spot stocks. Sak grades are plentiful and going into some high grade balloon tires with Egyptian Uppers principally used.

There are no well defined market prices on tire fabrics at the present time due, apparently, to the fact that some dealers are willing to take business at from five to ten cents a pound less than replacement value of the fabric. With a range of prices as wide as that received by buyers at this time it is impossible to say what the real market values are.

New York Quotations

May 24, 1924

Drills

38-inch 2.00-yard	yard	$0.22½ @
40-inch 3.47-yard		.13½ @
52-inch 1.90-yard		.24¼ @
60-inch 1.52-yard		.31 @

Duck

CARRIAGE CLOTH

38-inch 2.00-yard	yard	.23½ @
40-inch 1.47-yard		.31¼ @
72-inch 16.66-ounce		.52 @
72-inch 17.21-ounce		.53¼ @

MECHANICAL

Hose	pound	.45 @
Belting		.44 @

TENNIS

52-inch 1.35 yard	yard	.36 @

Osnaburgs

40-inch 2.35-yard	yard	.20 @
40-inch 2.48-yard		.19 @
40-inch 3.00-yard		.15¾ @
37½-inch 2.42-yard		.19½ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	yard	$0.13 @
Bombazine 60 x 48		.12¼ @
Plaids 60 x 48		.13 @
Plaids 48 x 48		.12 @
Surface prints 60 x 48		.13 @
Surface prints 64 x 60		.14 @

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	.16¼ @
48 x 48, 2.85-yard		.14¼ @
64 x 68, 3.15-yard		.14½ @
56 x 60, 3.60-yard		.12¼ @
48 x 44, 3.75-yard		.11 @

Sheetings, 36-inch

48 x 48, 5.00-yard	yard	.08⅞ @
40 x 40, 6.15-yard		.07¼ @

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Egyptian, karded	pound	$0.64	@	.67
Peeler, karded		.54	@	.56

CORD 23/5/3

Egyptian, combed	pound	.75	@	.80
Egyptian, karded		.67	@	.70
Peeler, combed			@	
Peeler, karded		.56	@	.58

CORD 13/3/3

Peeler, karded	pound	.54	@	.56

LENO BREAKER

8-oz. Peeler, karded	pound	.54	@	.56
10-oz. Peeler, karded		.54	@	.56

CHAFER

8.25-oz. Peeler, karded	pound	.52	@	.54
9.5-oz. Peeler, karded		.54	@	.56
12-oz. Peeler, karded		.54	@	.56
14-oz. Peeler, karded		.54	@	.56

The Cotton Outlook

American Crop Prospects

ALTHOUGH the coming American cotton crop will not become an active market factor for some months yet, the trade is beginning to devote considerable attention to prospects in the growing area. For three years in succession the United States, the world's greatest cotton growing country, has produced a crop under or only slightly exceeding ten million bales, an amount less than the world's annual consumption of American cotton. That this situation has not already become serious is due to the abnormal conditions of demand during the seasons 1920-21, when an enormous carryover was accumulated. Since that time the cotton world has been living on its capital, so to speak. But by the end of last season world stocks had become so reduced that this season's consumption must not exceed the year's production unless stocks are to be depleted so low that panic might result.

More Must Be Grown or Less Used

There are two alternatives: either to grow more cotton or to use less. Some curtailment is already in progress, brought about by high prices and general business hesitancy, but unless the next cotton crop is substantially increased the world must go on a curtailment basis amounting to at least 2,000,000 bales annually which will have to be undertaken chiefly by the two principal consumers, the United States and Great Britain. To offset this all the cotton producing countries of the world are planning for increased acreages, and in its colonies and protectorates Great Britain is keenly seeking to gain the cotton supremacy of the world.

Meanwhile what are the chances of the American crop? Speculation as to its probable volume is largely guesswork. Opinions vary widely and the known factors are variously interpreted according to the viewpoint. Generally speaking, growers view short crops and high prices with equanimity, consumers with apprehension. The spread of the boll weevil menace, however, is the present fly in the growers' ointment. To share about half the cotton grown with the weevil, at a time when labor is scanty and expensive, very largely offsets the advantage of high prices due to short crops. Moreover, weevil devastations are carrying cotton growing into new areas and forcing the older growers to adopt crop rotation or undertake the cultivation of other crops about which they know little.

Outlook in the Growing Area

The general outlook in the growing area is well reflected by the May bulletin of the Richmond Reserve Bank, which expresses belief that no reduction in cotton acreage is probable. It adds: "Last year the crop was profitable to the average grower in comparison to other agricultural products, and the low supply of cotton on hand at present encourages the farmer to believe that reasonably satisfactory prices are likely to prevail for the new crop." The bulletin points out, however, that labor is scarce, which may have some influence in restricting acreage. But on the other hand, it adds, "fertilizer is cheaper than a year ago, and the farmers are undoubtedly in better financial condition to plant a larger crop than they were in the spring of 1923."

Probable 1924 Acreage

An estimate of probable acreage and possible yield is difficult to form. American prophets are somewhat far apart in their views. Perhaps the most plausible and impartial estimate of American prospects is that of the British statistician, Prof. John A. Todd, author of the "World's Cotton Crops," writing in *Textile World*. On the experience of the preceding four years he figures a possible maximum crop of thirteen million bales, a more likely yield of something under twelve million bales and a possible minimum of about ten million bales.

The basis of this estimate is shown by the following table. No great value is claimed for it as a forecast, but it is presented in the hope of correcting the exaggerated and unfounded hopes of those who persist in the belief that, having had three short crops, we *must* now have a big one to save the situation. This is not impossible, but all the conditions tend to render it improbable.

CHANCES OF THE AMERICAN CROP IN 1924, FOUNDED ON THE EXPERIENCE OF THE PRECEDING FOUR SEASONS.

	1920-21	1921-22	1922-23	1923-24	1924-25 Probable maxima
Acreage planted—(acres 000's):					
Estimate, June 25	35,504	26,519	34,852	38,287	41,000
——— December	.....	32,332	.....	39,224	.....
Final, June next year	37,043	31,678	34,016	?	.....
Acreage harvested:					
Estimate, December	36,383	31,427	33,742	37,420	39,524
Final, June next year	35,878	30,509	33,036	?	.....
Acreage abandoned	1,165	1,169	980	1,804	1,476 (4 years' average)
Per cent (on latest figures)	3.4	3.7	2.9	4.6	3.6
Crop (bales of 478 lbs. net—000's):					
Final ginnings	13,440	7,954	9,762	10,129	11,800 (4 years' average)
Yield per acre, lbs.	178.4	124.5	141.3	129.4	143.4
Linters *not* included	440	398	609	670	770

Four-year averages are considered better guides than the common ten-year averages because of the changed situation caused by the boll weevil. As the period includes two poor, one good, and one fair year and includes the last year before the boll weevil came down on the Atlantic Coast in full force, it furnishes a pretty fair statistical basis.

Acreage Increase and Abandonment

In regard to acreage no law of acreages holds. The largest possible acreage consistent with labor conditions is to be expected in the face of the most tempting prices since the sixties. But little more can be done in acreage than last year, when every effort was made to grow a big crop except in the northern and western fringes of the cotton belt, chiefly in Texas, where the risks of drought and early frost are compensated by absence of the boll weevil. Acreage increases in these districts are thought likely to be some 400,000 acres. Acreage abandoned in other districts will probably approach 1,500,000 acres. An increase of 5 per cent throughout the belt, or a total of 41,000,000 acres planted and 39,500,000 acres harvested is thought to be the probable maximum acreage.

Average Yield the Crux of the Problem

Average yield per acre is the real crux of the problem and almost impossible of estimate because of the many practically incalculable factors, such as location, weather, boll weevil, labor supply and improved methods of cultivation. Last year's average was 129.4 pounds, that of the last four years 143.4 pounds, and of the last ten years 159.1. On the basis of 41 million acres planted and the ten-year average the expected crop would amount to a little over 13 million bales, while on the four-year average it would be barely 12 millions. The latter seems much the better guess unless a great diminution of the boll weevil occurs as the result of the past severe winter in the South.

CHILE'S PURCHASES OF AMERICAN-MADE AUTOMOBILE TIRES, pneumatic and solid, and tubes have increased from a total value in 1921 of $112,338 to $187,748 for 1922, the figure rising in 1923 to $214,843. During these years a steady advance is noted for each of these three lines of goods.

The Market for Chemicals and Compounding Ingredients

New York

THE VOLUME of business in compounding ingredients and pigments follows closely that of manufactured goods, since orders are placed by manufacturers only as the goods are needed. The demand in all lines has materially declined in the past few weeks although the volume is still fair in amount.

ACCELERATORS. Accelerators of one variety or another have become essential in practically all stocks in every line. They are either harmless or beneficial to aging quality in rubber goods.

Each organic accelerator has its practical appeal and the more popular ones seem to gain rapidly in favor. Super-accelerators are in special favor especially when time and steam are important factors.

CARBON BLACK. Carbon black is in steady demand. There has been a little falling off, but business with the rubber trade for the past month was well maintained. The prices for carbon black have primed up slightly and the advance was well maintained.

FILLERS. Asbestine, barytes, and whiting are in routine demand or better. Clay is moving well. Its popularity as a toughener is so general that when mills are operating at anything like full capacity a shortage is felt. Inconvenience of this sort will ultimately disappear as output facilities are enlarged by the producers.

LEAD PIGMENTS. Litharge and sublimed lead are standard in many mechanical goods compounds, and in footwear, clothing and other dry cured goods. The volume of routine demand in these lines as at the present time results in the movement of a large total tonnage of lead pigments, although the market may be called only fair.

OXIDE OF IRON. This standard dry color, always a favorite in the mechanical rubber goods trade is experiencing demand from manufacturers of rubber flooring as well.

SOLVENTS. Rubber solvents, benzol, solvent naphtha and gasoline have not been called for as heavily by the proofing and cement trades the past six weeks. The demand, however, is active. Solvent naphtha as usual is in rather short supply.

ZINC OXIDE. Falling off in consumption of zinc oxide among rubber makers, particularly in the tire division of the industry, is notable. It is wholly due to the general reduction in output in many branches of the industry. Many rubber mills are asking for delayed deliveries and are working as nearly as possible to current requirements. However, zinc oxide producers are compensated for these conditions by good seasonable demand for their stocks in the paint trade.

Accelerators, Inorganic

Lead, carbonate	*lb.*	$0.10¼	@
Lead, red	*lb.*	.12	@
sublimed blue	*lb.*	.09¾	@
sublimed white	*lb.*	.09¾	@
Lime, flour	*lb.*	.02½	@
R. M.	*lb.*	.01¼	@ .01½
R. M. hydrated	*ton*	25.00	@
superfine	*lb.*	.01½	@
Litharge, domestic	*lb.*	*.10½	@ .11½
imported	*lb.*	*.17	@
Magnesia, carbonate, light	*lb.*	.07½	@ .09
calcined, light (bbls.)	*lb.*	.24	@
calcined, ex. light (bbls.)	*lb.*	.40	@
calcined, md. light (bbls.)	*lb.*	.15	@
calcined, heavy (bbls.)	*lb.*	.04	@ .05
Orange mineral A.A.A.	*lb.*	.15	@
Rubber lead	*lb.*	.10	@

Accelerators, Organic

A-7	*lb.*	.75	@ .85
A-19	*lb.*	.85	@ .90
Accelemal	*lb.*	.28	@
Accelerene (f. o. b. English port)	*lb.*	13*s.*	@
Aldehyde ammonia powder	*lb.*	.95	@
Aniline (f. o. b. factory)	*lb.*	.16½	@ .17
sulphate	*lb.*	.33	@
Cryline	*lb.*	.60	@
Diphenylguanidine	*lb.*	1.10	@ 1.15
Ethylidene aniline	*lb.*	.70	@ .75
Excellerex	*lb.*	.40	@ .45
Formaldehyde aniline	*lb.*	.42½	@
Hexamethylene tetramine	*lb.*	.85	@
Lead oleate (bbls.)	*lb.*	.15	@
Methylene aniline	*lb.*	.37	@ .42
No. 999	*lb.*	.16	@
Paraldehyde	*lb.*	.17	@ .19
Paraphenylene diamine	*lb.*	1.40	@ 1.50

*Nominal.

New York Quotations

May 24, 1924

Super-sulphur, No. 1	*lb.*	$0.50	@ $0.60
No. 2	*lb.*	.25	@ .35
Tuads (Tetramethyl thiuram-disulphide)	*lb.*	6.00	@
Thiocarbanilide	*lb.*	.26	@ .30
Triphenylguanidine	*lb.*	.75	@

Acids

Acetic 28% (bbls.)	*cwt.*	3.38	@
glacial (carboys)	*lb.*	.12	@
Cresylic (95% straw color)	*gal.*	.65	@ .75
(95 dark)	*gal.*	.63	@ .70
Sulphuric, 66 degrees	*lb.*	.02	@

Alkalies

Caustic soda	*lb.*	.03	@
flake, 76% (factory)	*cwt.*	3.50	@
solid, 76% (factory)	*cwt.*	3.10	@

Colors

BLACK

Aerofloted arrow	*lb.*	.09	@ .12
Bone	*cwt.*	7.80	@ 8.25
Carbon black	*lb.*	.09	@ .14
compressed	*lb.*	.09½	@ .14
Drop	*cwt.*	7.80	@ 8.25
Ivory black	*lb.*	.15	@ .45
Lampblack	*lb.*	.11	@ .40
Micronex	*lb.*	.09½	@ .15
Nonfli	*lb.*	.40	@
Shawinigan	*lb.*	.15	@ .16

BLUE

Cobalt	*lb.*	.21	@ .26
Gritless blue	*lb.*	2.00	@ 4.00
Prussian	*lb.*	.38	@ .40
Ultramarine	*lb.*	.08	@ .35
T. K.	*lb.*	.25	@ .30

BROWN

Iron oxide	*lb.*	.04½	@ .05½
Sienna, Italian	*lb.*	.06	@ .14½
Umber, Turkey	*lb.*	.04	@ .04½

GREEN

Chrome, light	*lb.*	$0.30	@ $0.31
medium	*lb.*	.32	@ .35
dark	*lb.*	.35	@ .38
commercial	*lb.*	.10½	@ .11½
tile	*lb.*	.13	@ .15
Gritless green	*lb.*	2.00	@ 3.00
Oxide of chromium	*lb.*	.36	@
T. K.	*lb.*	.40	@

RED

Antimony, golden	*lb.*	.20	@ .25
golden T. K.	*lb.*	.18	@
golden R.M.P. No. 7	*lb.*	.20	@
golden, 15/17% G. E.	*lb.*	.20	@ .22
golden, 15/17% F. S.	*lb.*	.18	@ .20
golden, No. 1	*lb.*	.30	@
golden, No. 2	*lb.*	.20	@
Tideco	*lb.*	.22	@ .52
Antimony, crimson	*lb.*	.45	@ .50
crimson T. K.	*lb.*	.48	@
crimson, 15/17% G. E.	*lb.*	.40	@ .45
crimson, 15/17% F. S.	*lb.*	.39	@
crimson, R.M.P. No. 3	*lb.*	.48	@
crimson F.	*lb.*	.45	@
7-A	*lb.*	.35	@
Golden pentasulphide T. K.	*lb.*	.30	@
Vermilion, 5% F. S.	*lb.*	.65	@
Vermilion 15/17% F.S.	*lb.*	.50	@
T. K.	*lb.*	1.35	@
Arsenic-sulphide, red	*lb.*	.15	@
Gritless red (four shades)	*lb.*	1.50	@ 3.00
purple	*lb.*	2.00	@ 3.00
Indian maroon, English	*lb.*	.11	@
Iron oxide, domestic	*lb.*	.09	@ .12
English	*lb.*	.12	@ .14
Indian	*lb.*	.11	@ .12
pure bright	*lb.*	.12	@ .14
reduced	*lb.*	.10	@
Spanish	*lb.*	.03	@ .04
Venetian	*lb.*	.03	@ .06
Oximony	*lb.*	.16	@
Pará toner	*lb.*	.95	@ 1.00
Toluidine toner	*lb.*	2.00	@ 2.10
Vermilion, English	*lb.*	1.35	@ 1.45

COLORS—*Continued*

WHITE

Akcolith	lb.	$0.06½ @	$0.07
Albalith	lb.	.06⅞ @	.07½
Aluminum bronze	lb.	.55 @	1.25
Lithopone	lb.	.07 @	
Lithopone, Sterling	lb.	.06¼ @	.07
Azo	lb.	.06¼ @	.06¼
Red Seal, imported	lb.	.06¼ @	.07¼
T. O. Pigment	lb.	.15½ @	.16¼
Zinc oxide:			
AAA, lead free	lb.	.08 @	.08¼
Azo (factory):			
ZZZ (lead free)	lb.	.08 @	.08¼
ZZ (—5% leaded)	lb.	.07¼ @	.07½
Z (8.10% leaded)	lb.	.07¼ @	.07½
French process, Florence brand			
Green seal	lb.	.11 @	.11¼
Red seal	lb.	.10 @	.10¼
U. S. P.	lb.	.16 @	.18
White seal	lb.	.12 @	.12¼
Horse Head brands			
Selected	lb.	.08¼ @	.08½
Special	lb.	.08¼ @	.08⅞
XX red	lb.	.08½ @	.08¾
Leaded brands			
Lehigh	lb.	.07¼ @	.07½
Standard	lb.	.07¼ @	.07½
Sterling	lb	.07¼ @	.07½
Superior	lb.	.07¼ @	.07½
Palmerton process			
Kadox, black	lb.	.12 @	.12¼
blue	lb.	.11 @	.11¼
red	lb.	.10 @	.10¼
Snow white	lb.	.11½ @	

YELLOW

Arsenic	lb.	.75 @	
Chrome	lb	.18 @	.18½
Gritless yellow	lb.	2.50 @	4.00
India rubber	lb.	.75 @	
Ochre, domestic	lb.	.02 @	.02½
imported	lb.	.01¾ @	.03

Compounding Ingredients

Aluminum flake (carloads)	ton	29.00 @	
filler	ton	23.00 @	
hydrate, light	lb.	.17 @	.18
Ammonia carbonate	lb.	.13 @	.14½
Asbestine	ton	15.00 @	25.00
Aluminum silicate	ton	22.00 @	25.00
Barium, carbonate	ton	68.00 @	70.00
dust	lb.	.05 @	.06
Barytes, imported	ton	28.00 @	33.00
pure white	ton	23.90 @	
off color	ton	20.00 @	
uniform floated	ton	23.90 @	
water ground and floated	ton	23.00 @	26.00
Basofor	lb.	.04½ @	
Blanc fixe	lb.	.04 @	.04¼
Carrara filler (factory)	lb.	.01¾ @	.02
Chalk, precip. extra light	lb.	.04½ @	.05
heavy (f.o.b. factory)	lb.	.03¼ @	.04
Clay, Dixie	ton	22.00 @	35.00
Blue ribbon (carloads)	ton	14.00 @	
Blue Ridge	ton	12.00 @	26.00
Catalpo	ton	40.00 @	
China	lb.	.01½ @	
Tideco (factory)	ton	10.00 @	
Cotton flock, black	lb.	.12 @	
light-colored	lb.	.12 @	.13½
white	lb.	.14½ @	.23
Cotton linters clean mill-run	lb.	.06 @	
Fossil flour (powdered)	ton	60.00 @	
(bolted)	ton	60.00 @	

* Nominal.

Chemical Market—*Continued*

New York Quotations

May 24, 1924

Glue, high grade	lb.	$0.22 @	$0.30
medium	lb.	.20 @	.26
low grade	lb.	.15 @	.18
Graphite, flake	lb.	.06½ @	.12
Infusorial earth (powd.)	ton	60.00 @	
(bolted)	ton	65.00 @	
Lime (bolted)	lb.	.01½ @	
Mica, amber	lb.	.05 @	
powdered	lb.	*.15 @	
white	lb.	.06 @	
Pumice stone, powdered	lb.	.03 @	.05
Rotten st., powd. (bbls.)	lb.	.02½ @	.04½
Slate flour (factory)	ton	11.00 @	
Soap bark, cut	lb.	.09¼ @	.09¼
Soapstone, powdered, gray	ton	12.00 @	22.00
Sodium bicarbonate (bbls.)	lb.	.02½ @	
Starch, powd. corn (bags)	cwt.	3.17 @	3.27
(bbls.)	cwt.	3.44 @	3.54
Talc, soapstone	ton	25.00 @	
Terra blanche	ton	23.00 @	27.00
Whiting, Alba	cwt.	@	
chalk	ton	16.50 @	25.00
commercial	cwt.	.90 @	1.00
English, cliffstone	cwt.	1.50 @	2.00
gilders (bolted)	cwt.	1.10 @	1.20
K. T.	ton	@	
Perfection	ton	12.50 @	23.00
Quaker	ton	13.00 @	22.00
Superfine	ton	12.50 @	22.50
Sussex	ton	8.00 @	16.00
Witco	ton	20.00 @	
York	ton	8.00 @	
Wood pulp, XXX	ton	35.00 @	
X (f. o. b. factory)	ton	25.00 @	

Mineral Rubber

Genasco (factory)	ton	50.00 @	52.00
Gilsonite	ton	65.00 @	
Granulated M. R.	ton	40.00 @	60.00
Hard hydrocarbon	ton	31.00 @	50.00
Liquid rubber	lb.	.10 @	
Ohmlac Kapak, K-R	ton	50.00 @	65.00
K-4	ton	175.00 @	
Soft hydrocarbon	ton	30.00 @	50.00
320/340 M. P. hydrocarbon	ton	45.00 @	50.00
300/310 M. P. hydrocarbon	ton	40.00 @	45.00
Pioneer, M. R., solid (fac.)	ton	42.00 @	44.00
M. R. granular	ton	52.00 @	54.00
Robertson, M. R., solid	ton	35.00 @	75.00
M. R. granular (factory)	ton	42.00 @	80.00
Rubrax (factory)	ton	60.00 @	
Synpro, gran. M. R. (fac.)	ton	55.00 @	

Resins and Pitches

Tar, pine, retort	bbl.	10.50 @	11.00
kiln	bbl.	10.50 @	12.00
Pitch, Burgundy	lb.	.05½ @	
coal tar	bbl.	8.00 @	
Fluxol hardwood	lb.	.03 @	.04
pine tar	bbl.	6.00 @	
ponto	lb.	.05½ @	
Rosin, K (bbl.) 280 lbs.		6.55 @	
strained (bbl.) 280 lbs.		6.40 @	
Shellac, fine orange	lb.	.75 @	*.90
substitute	gal.	1.50 @	

Softeners

Avoilas compound	lb.	.14 @	
Castor, No. 1, U. S. P.	lb.	.16½ @	
No. 3, U. S. P.	lb.	.16 @	
Corn, crude (bbls.)	lb.	.12 @	
Cotton, Summer yellow	lb.	.11 @	
Cycline	gal.	.35 @	.38
Glycerine	lb.	$0.17 @	$0.17½
Linseed, raw	gal.	.95 @	
Palm lagos	lb.	.10 @	
oil clarified	lb.	.09¼ @	
Palm, niger	lb.	.09½ @	
Parra M. R. flux	lb.	.06 @	.07
Peanut, crude	lb.	.12 @	
refined	lb.	.14 @	
Petrolatum, standard	lb.	.06 @	.08
Petrolatum, sticky	lb.	.08 @	.10
Pine, steam distilled	gal.	.60 @	.65
Rapeseed, refined	gal.	.88 @	
blown	gal.	1.04 @	
Rosin	gal.	.45 @	.50
Synpro	gal.	@	
Soya bean	lb.	.12¼ @	.12½
Tar	gal.	.26 @	
Woburn	lb.	.05 @	
Woolgrease (Lanolin)	lb.	.10 @	.10½

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.])	lb.	.25 @	.25½
Benzol (90% drums [7.21 lbs. per gal.])	gal.	.26 @	.31
pure (drums)	lb.	.35 @	.37
Carbon bisulphide (drms. [10.81 lbs. per gal.])	lb.	.07 @	.08
tetrachloride (drums, [13.28 lbs. per gal.])	lb.	.07½ @	.08
No. 303			
Tankcars	gal.	.21 @	
Drums, carlots	gal.	.24 @	
Drums, less carlots	gal.	.27 @	
Motor gasoline (steel bbls.)	gal.	.20 @	
Naphtha, V. M. & P.	gal.	.19 @	
solvent (drums extra)	gal.	.35 @	
68° Bé., 122°, 324°	gal.	.17 @	
70° Bé., 114°, 314°	gal.	.18 @	
71° Bé., 112°, 304°	gal.	.19 @	
Cymene (factory)	gal.	2.00 @	2.50
Toluol, pure (7.21 lbs. per gal.)	gal.	@	
Turpentine, spirits	gal.	.90 @	
wood, steam distilled	gal.	.81 @	

Substitutes

Black	lb.	.08 @	.14
Brown	lb.	.10 @	.15
White	lb.	.09 @	.16
Brown factice	lb.	.09 @	.15
White factice	lb.	.09½ @	.16
T. K., various	lb.	.12 @	.15

Vulcanizing Ingredients

Black hypo	lb.	.18 @	
13% F. S.	lb.	.20 @	
Sulphur chloride	lb.	.08 @	.13½
Sulphur, Bergenport brand, 100% pure (bbls.)	cwt.	2.60 @	3.15
(bags)	cwt.	2.35 @	2.90
Sulphur, Bklyn bd. (bbls.)	cwt.	2.60 @	3.15
superfine com. (bgs.)	cwt.	2.00 @	2.50
(bbls.)	cwt.	2.40 @	2.90
Rubber makers	lb.	.03¾ @	

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	lb.	.40 @	.45
ceresine, white	lb.	.10 @	.12
carnauba	lb.	.19 @	
montan	lb.	.05 @	.06½
ozokerite, black	lb.	.18 @	.24
green	lb.	.27 @	.28

Paraffin

122/124 white crude scale	lb.	.05⅞ @	
124/126 white crude scale	lb.	.06 @	
120/122 fully refined	lb.	.06¼ @	
125/127 fully refined	lb.	.06½ @	

RUBBER COMPOUNDING AND TESTING SHOP

A rubber compounding and testing shop fully equipped for developing compounds, vulcanizing and testing all lines of rubber goods, is now in operation in Long Island City, New York, within the metropolitan district.

The experimental requirements of the rubber manufacturer were the first consideration in planning this installation. Researches connected with Micronex compounding and the general problem of rubber reinforcement, theoretical as well as practical, will be undertaken, but primarily it is a rubber compounding shop.

In addition to regular service and research work which will be conducted by D. F. Cranor, the laboratory facilities are open to any rubber manufacturer who desires to employ them.

This technical shop has been established by the Binney & Smith Co., 41 E. Forty-second street, New York, in connection with their rubber development department.

EXPORTS OF AMERICAN MECHANICALS INCREASE

Total United States exports for the year 1923 of mechanical rubber goods showed a large increase in values as compared with the year previous, the figures standing at $3,154,594 for 1922, and $4,495,789 for 1923.

More detailed estimates reveal that rubber belting values rose from $1,268,235 in 1922 to $2,032,368 in 1923, while the figures for rubber hose exports also show an advance from $1,340,244 in 1922 to $1,732,939 for the year following. Packing stood at $546,115 in 1922, as against $730,482 in 1923.

MEXICO'S PURCHASES OF AMERICAN RUBBER BELTING INCREASED from a value of $178,622 in 1922 to $263,200 in 1923. While the corresponding values of rubber hose declined from $234,443 in 1922 to $215,313 in 1923, the figures for packing rose from $95,449 in 1922 to $112,079 in the year following.

Metal Market Review

New York

During May the markets generally remained quiet, with little demand from consumers. Some statistics, however, recently compiled by the Minerals Section, Department of Commerce, are of interest as showing the steadily increasing consumption by American industries of the non-ferrous minerals and metals. Imports along these lines totaled during the first quarter of 1924 803,191,676 pounds, indicating that not only a large proportion of the domestic production is being utilized, but that there is an increasing demand for additional supplies from foreign sources.

ALUMINUM. The outside market is beginning to show larger supplies. Obviously the markets of the world have become a checkerboard on which those in command of the aluminum situation can arrange the supply so as to reap the richest harvest.

ANTIMONY. Along with other metals, the market for antimony was rather easy during the first part of the month, later becoming somewhat firmer. The London price remains unchanged at £40.

COPPER. The demand for this metal shows little improvement, and prices have declined slightly. Consumption, however, in the United States showed during 1923, according to reports by the Anaconda Copper Co., an increase of 25 per cent over 1922. Shipments of copper in April totaled approximately 239,000,000 pounds, the March figures being 271,000,000 pounds.

LEAD. During the first week of May there was considerable improvement in the buying of lead, in view of higher prices abroad. Production continues as heavy as at the peak of the year and is overtaking consumption, which is falling off.

NICKEL. Quotations for shot and ingot nickel are unchanged at from 27 to 32 cents a pound, with electrolytic nickel held at 30 to 32 cents by leading producers. In the outside market both shot and ingot nickel are quoted at 28 to 32 cents a pound.

STEEL. The production of steel reached its peak in March. The shrinkage in output which was continuous throughout April was more rapid in the final week of that month, while three weeks later the steel ingot production had declined to two-thirds of the peak rate of early March, and was the lowest since September, 1922. Prices, however, during the last of May tended to become more stable.

TIN. The demand for tin has been spasmodic, the bulk of recent tin arrivals apparently going to consumers, while strong interests control the remainder. Prices continue very low. Statistics for April showed that arrivals of tin during the month totaled 10,110 tons.

ZINC. Conditions in the zinc industry have somewhat improved recently, and there is a better demand abroad for this metal. London prices have been steadily rising of late.

Basic Metals

MAY 27, 1924

	Price per pound
Aluminum, virgin, 98@99 per cent	$28.00 @$29.00
Antimony, pound	8.37½@ 8.50
Copper—Lake, spot, pound	.13 @ .13½
Electrolytic, spot	.12¾@ .12⅞
Casting refinery	.12⅝@
Lead, spot, New York, pound	6.90 @ 7.00
Lead, spot, East St. Louis	6.65 @ 6.70
Nickel, ingot, pound	.29 @ .32
Tin, spot	.41⅛@
Zinc, spot, New York	6.12 @ 6.17
Zinc, spot, East St. Louis	5.77 @ 5.82

Steel Wire

MAY 22, 1924

BASE PRICE* ON NO. 9 GAGE AND COARSE	Price per pound
Bright basic	4.25 @ 4.50
Annealed soft	4.50 @ 4.75
Galvanized annealed	5.15 @ 5.40
Copper basic	5.15 @ 5.40
Tinned soft Bessemer	6.15 @ 6.40

*Regular extras for lighter gage.

Copper Wire

	Base price
Bare copper wire, lb.	.15⅜@
No. 6 B. & S. gage, lb.	.15⅜@
No. 8 B. & S. gage, lb.	.15⅜@
No. 14 B. & S. gage, lb.	.16⅜@

CHILE DOUBLES PURCHASES OF AMERICAN MECHANICAL RUBBER GOODS

It is interesting to note that Chile's importations in 1923 of American mechanical rubber goods represented a little more than double the value for the year previous, the total for 1922 being $148,841, while the 1923 figure was $299,891. Detailed estimates show that the rubber belting imported from the United States during 1923 was valued at $206,659, as compared with only $61,094 in 1922. There was a slight falling off, at $76,155, in the 1923 figures for rubber hose, as compared with $81,606 in the year previous. The total for packing advanced, however, from $6,141 in 1922 to $17,077 in 1923. Chile's purchase of rubber belting for December alone of last year was estimated at $63,288.

ARGENTINA'S IMPORTATIONS OF AMERICAN MECHANICAL RUBBER GOODS DOUBLE IN VALUE

As in the case of Chile, Argentina's purchases last year of American mechanical rubber goods were more than double in value those of the year previous, the total for 1923 being $204,348, as against only $96,834 for 1922. Of these totals the 1923 value for rubber belting was estimated at $102,966, as compared with only $45,154 in 1922, while the 1923 figure for rubber hose was $92,004, as against only $42,252 for 1922, a doubling of values in both cases. The figures for packing were practically the same for both 1922 and 1923, the totals being respectively $9,428 and $9,378.

DENMARK'S IMPORTATIONS OF AMERICAN TIRES INCREASING

Denmark's importations of American-made automobile casings rose in the last three years from a value in 1921 of $258,630 to $483,973 in 1922, and $569,318 in 1923. Solid tires also advanced from $5,407 in 1921 to $24,309 in 1922, declining however in 1923 to $16,145. The figures for inner tubes show a steady increase from $15,333 in 1921 to $44,807 in 1922 and $61,695 in 1923. Total estimates for importations of all three lines of these American-made goods are as follows: 1921, $279,370; 1922, $553,089; and 1923, $647,158.

BALLOON AND BALLOON-TYPE TIRES

There are now three distinct types of tires on the market: the standard high pressure tire, and the balloon, and the balloon-type. The balloon tire requires a wheel of smaller diameter than that used on all cars manufactured in recent years, while the balloon-type has been made expressly for use with present wheels.—Technical Service Department, United States Tire Co., 1790 Broadway, New York, N. Y.

A NEW ORGANIZATION HAS BEEN RECENTLY FORMED IN ORDER TO aid in the reestablishment of commercial relations between the United States and Germany. Those desiring information should address: Board of Trade for German-American Commerce, Inc., 60 Broadway, Suite 507, New York, N. Y.

THE SECOND ANNUAL MEETING OF SHEET STEEL MANUFACTURERS was held this year from May 12 to 15 at the Hotel Greenbrier, White Sulphur Springs, West Virginia. Among the addresses was one regarding "Labor Supply," prepared by Cyrus S. Ching, supervisor of industrial relations, United States Rubber Co.

Exports of India Rubber Manufactures from the

EXPORTED TO	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Waterproofed Auto Cloth Value	Waterproofed Clothing Value
EUROPE													
Austria	.....	.....	.....	.....	.....	$120	.....	.....	.....	.....	.....	.....	.....
Azores and Madeira Islands	.....	.....	.....	.....	28	106	.....	.....	.....	.....	.....	.....	$11
Belgium	$256	.....	.....	$616	.....	.....	.....	.....	120	$244	.....	$971	.....
Bulgaria	.....	$355	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	72	122	.....	.....	.....
Denmark	125	.....	$1,547	.....	240	622	300	$190	35,411	28,910	.....	.....	.....
Esthonia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Finland	1,793	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
France	2,755	365	3,421	9,174	.....	.....	60	41	.....	.....	.....	1,000	.....
Germany	.....	.....	49	.....	.....	.....	.....	.....	.....	.....	.....	268	.....
Greece	.....	242	.....	.....	.....	.....	.....	.....	.....	.....	.....	59	.....
Hungary	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iceland and Faroe Islands	.....	.....	.....	.....	.....	.....	168	457	.....	.....	.....	.....	.....
Italy	1,618	.....	.....	4,992	144	509	.....	.....	3,593	2,643	$287	198	12
Latvia	714	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malto, Gozo, and Cyprus Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	100	4,180	1,552	.....	.....	.....	72	49	336	383	754	275	232
Norway	410	2,075	10	.....	279	808	660	1,012	10,128	8,502	.....	1,036	.....
Portugal	.....	54	.....	.....	862	3,393	.....	.....	.....	.....	376	.....	126
Rumania	.....	.....	144	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia in Europe	.....	.....	82	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain	1,600	.....	96	694	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sweden	1,872	2,056	465	.....	162	468	1,203	3,806	165	299	418	3,408	.....
Switzerland	790	123	960	.....	36	99	.....	.....	362	477	.....	.....	37
Ukraine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
England	10,194	36,900	15,010	57,246	8,119	19,871	4,362	3,212	103,291	82,515	1,327	9,017	650
Scotland	.....	2,230	.....	.....	.....	.....	1,104	805	6,207	4,561	.....	177	254
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, EUROPE	$22,227	$48,580	$23,336	$72,722	9,906	$25,996	7,929	$9,572	159,685	$128,656	$3,162	$16,409	$1,322
NORTH AMERICA													
Canada	$15,946	$14,723	$9,232	$6,114	2,775	$8,694	6,112	$3,095	18,291	$12,117	$1,306	$43,194	$5,592
British Honduras	146	18	35	.....	.....	.....	360	332	264	249	.....	.....	.....
Costa Rica	93	542	278	.....	.....	.....	.....	.....	186	188	1,482	.....	562
Guatemala	50	102	.....	.....	.....	.....	372	292	5,294	4,130	87	178	907
Honduras	225	1,463	113	.....	.....	.....	.....	.....	64	56	999	.....	304
Nicaragua	.....	211	252	.....	26	122	.....	.....	312	270	2,103	591	.....
Panama	521	4,019	425	.....	66	246	1,008	475	7,111	6,589	787	141	512
Salvador	.....	.....	.....	.....	.....	.....	.....	.....	648	501	1,652	193	538
Mexico	24,089	20,914	6,261	.....	54	207	1,954	1,948	36,740	34,388	9,421	725	12,210
Miquelon and St. Pierre Islands	.....	.....	.....	.....	744	2,353	.....	.....	.....	.....	.....	.....	537
Newfoundland and Labrador	246	1,855	.....	.....	2,139	6,761	355	229	11,196	6,411	926	.....	8,764
Bermuda	.....	277	131	.....	35	116	77	55	231	213	.....	.....	122
Barbados	.....	15	.....	.....	.....	.....	.....	.....	72	65	.....	.....	.....
Jamaica	.....	609	28	.....	.....	.....	104	65	747	596	.....	418	.....
Trinidad and Tobago	.....	435	473	.....	.....	.....	.....	.....	510	317	255	213	181
Other British West Indies	.....	58	.....	.....	.....	.....	66	45	987	848	.....	64	.....
Cuba	2,089	19,494	4,962	.....	234	675	1,448	1,284	117,769	81,508	8,813	2,398	46,008
Dominican Republic	.....	535	285	.....	48	211	.....	.....	4,932	3,686	449	467	100
Dutch West Indies	.....	24	578	.....	.....	.....	.....	.....	5,396	3,659	262	.....	1,137
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Haiti	118	156	19	.....	.....	.....	.....	.....	2,086	2,002	151	17	.....
Virgin Islands of United States	15	.....	9	.....	.....	.....	.....	.....	391	373	66	.....	.....
TOTALS, NORTH AMERICA	$43,538	$65,450	$23,081	$6,114	6,121	$19,385	11,856	$7,820	213,227	$158,166	$28,759	$48,599	$77,474
SOUTH AMERICA													
Argentina	$5,080	$4,775	$1,683	.....	924	$3,055	7,758	$6,372	300	$330	$10,195	$15,800	$100
Bolivia	3,473	604	.....	.....	.....	.....	.....	.....	209	207	57	.....	.....
Brazil	7,041	2,873	128	.....	.....	.....	.....	.....	.....	.....	.....	4,767	377
Chile	53,353	5,649	1,292	.....	336	215	4,804	3,114	1,000	729	12	3,185	.....
Colombia	3,677	1,823	492	.....	.....	.....	.....	.....	3,909	3,203	6,922	165	259
Ecuador	.....	1,322	1,248	.....	.....	.....	.....	.....	5,323	4,089	690	97	.....
Falkland Islands	108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British Guiana	.....	.....	48	.....	.....	.....	.....	.....	.....	.....	.....	154	27
Dutch Guiana	.....	172	.....	.....	.....	.....	.....	.....	613	562	.....	.....	.....
Paraguay	.....	.....	90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	648	1,460	2,035	.....	96	412	36	101	144	129	734	381	1,379
Uruguay	56	155	226	.....	78	236	.....	.....	7,824	6,009	1,817	5,250	5,288
Venezuela	216	2,334	2,614	.....	.....	.....	.....	.....	.....	.....	2,771	.....	.....
TOTALS, SOUTH AMERICA	$73,652	$21,167	$9,856	.....	1,434	$3,918	12,598	$9,587	19,322	$15,258	$23,198	$29,799	$7,430
ASIA													
Aden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	$481	$602	$516	.....	.....	.....	.....	.....	1,368	$1,305	.....	$510	.....
Ceylon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	285	.....
Straits Settlements	.....	3,564	50	.....	24	$64	.....	.....	2,068	1,808	$377	236	.....
Other British East Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,678	.....
China	840	962	95	.....	51	108	2,560	$2,062	5,400	5,136	186	5,552	.....
Chosen	.....	.....	56	.....	.....	.....	2	3	.....	.....	.....	.....	.....
Java and Madura	3,115	194	1,370	.....	.....	.....	.....	.....	1,992	3,218	.....	.....	$41
Other Dutch East Indies	.....	.....	1,316	.....	.....	.....	96	74	.....	.....	.....	75	94
French Indo-China	.....	.....	.....	.....	.....	.....	.....	.....	168	195	.....	.....	.....
Hongkong	.....	19	.....	.....	.....	.....	588	449	762	806	.....	.....	.....
Japan	10,273	3,895	10,050	18,688	852	1,875	7,239	6,371	1,070	1,001	.....	528	1,126
Kwantung, leased territory	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Palestine and Syria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philippine Islands	6,243	1,971	802	.....	348	808	2,352	1,624	84,528	59,482	15,643	4,743	29,339
Siam	.....	.....	.....	.....	.....	.....	.....	.....	576	479	.....	.....	.....
Other Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, ASIA	$20,952	$11,207	$14,255	$18,688	1,275	$2,855	12,837	$10,583	97,932	$73,430	$16,206	$13,607	$30,600

United States by Countries During March, 1924

Pneumatic Casings			Solid Tires		Pneumatic Tubes			Tire Repair Materials	Hard Rubber Goods			Rubber Water Bottles and Fountain Syringes	Drug-gists' Rubber Sundries	Bath-ing Caps	Rubber Toys, Balls and Balloons
Automobile			Automobile and Motor Truck		Automobile				Battery Jars and Accessories	Other Electrical Supplies					
Number	Value	Others Value	Value	Others Value	Number	Value	Others Value	Value	Value	Value	Others Value	Value	Value	Value	Value
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
48	$528	.....	.....	.....	72	$108	.....	.....	.....	.....	.....	.....	.....	.....	.....
265	5,447	$25	$383	.....	12	72	$45	$12	.....	$128	.....	$24	$893	$808	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$1,292
9,550	92,103	57	6,161	.....	9,080	11,557	8	2,024	.....	.....	.....	30	274	3,385	256
43	1,185	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
956	12,822	156	.....	.....	1,034	2,086	36	.....	.....	.....	.....	.....	.....	.....	.....
47	1,736	.....	.....	.....	.....	.....	.....	1,489	.....	.....	$7,000	334	1,606	4,144	10
6	90	.....	.....	.....	.....	.....	.....	420	.....	.....	.....	.....	35	.....	.....
115	977	.....	23	.....	75	101	.....	16	$108	.....	.....	.....	.....	.....	.....
164	2,641	.....	.....	.....	250	500	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,441	15,750	.....	.....	.....	1,388	2,562	.....	150	.....	.....	200	5	64	2,572	.....
130	1,459	.....	.....	.....	90	154	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	199	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,269	16,082	1,113	1,374	.....	885	2,729	196	866	.....	270	.....	403	582	1,134	1,964
2,020	29,761	1,341	2,286	.....	2,129	3,633	100	62	30	.....	.....	.....	.....	.....	95
736	8,654	.....	.....	.....	2,906	5,525	.....	100	.....	.....	29	.....	64	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	152	.....	.....	.....	40	50	.....	825	.....	.....	.....	.....	.....	.....	.....
469	14,351	.....	7,420	.....	172	624	.....	84	.....	42	22	.....	103	.....	55
2,284	29,833	.....	6,164	.....	1,889	3,200	13	353	.....	3,844	.....	448	2,574	1,716	3,431
666	8,423	535	.....	.....	498	850	65	.....	.....	.....	1,413	335	23	1,897	86
66	1,901	.....	.....	.....	16	30	.....	.....	.....	.....	.....	.....	.....	.....	.....
20,826	171,809	.....	63,771	.....	17,513	18,299	257	1,786	47	.....	19,232	658	19,817	20,925	40,967
112	1,388	.....	8,683	.....	200	234	.....	.....	.....	.....	.....	.....	226	2,358	3,459
40	343	.....	.....	.....	113	189	.....	151	.....	.....	.....	.....	.....	.....	.....
41,293	$417,634	$3,227	$96,265	.....	38,362	$52,503	$720	$8,338	$185	$4,284	$27,896	$2,237	$26,261	$38,939	$51,615
7,041	$84,545	$231	$25,340	$2,140	2,981	$8,468	.....	$8,783	$14,077	$4,682	$19,887	$666	$13,236	$4,802	$10,101
2	80	.....	.....	.....	2	10	.....	.....	.....	.....	.....	48	9	6	.....
95	1,361	.....	.....	113	60	107	.....	.....	.....	.....	.....	14	33	.....	325
189	3,441	.....	.....	.....	286	541	.....	51	.....	.....	.....	.....	74	52	150
20	503	.....	857	.....	16	40	.....	.....	.....	.....	104	.....	44	.....	21
8	72	3	.....	.....	135	216	.....	59	.....	.....	121	.....	44	68	132
931	12,226	735	166	390	1,306	2,404	.....	251	.....	.....	.....	.....	875	42	400
254	5,254	87	.....	.....	274	710	.....	.....	.....	.....	.....	.....	9	42	477
4,098	56,378	344	1,212	106	4,954	13,245	57	1,312	79	322	2,566	154	3,604	54	2,448
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
269	3,893	.....	142	267	405	751	.....	104	.....	.....	4	.....	78	.....	234
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14	148	43	.....
47	372	.....	300	.....	35	53	.....	.....	.....	.....	.....	.....	.....	30	.....
305	3,938	19	288	.....	198	397	.....	125	.....	.....	.....	.....	.....	.....	.....
213	2,436	.....	595	.....	68	105	.....	75	.....	.....	.....	.....	117	.....	.....
22	408	32	.....	.....	39	54	.....	.....	.....	68	.....	.....	.....	.....	.....
8,703	92,811	2,560	25,025	4,404	14,310	21,324	25	7,104	52	111	307	534	4,752	1,929	5,691
1,212	12,855	.....	1,177	.....	945	1,681	.....	52	.....	.....	35	13	149	.....	121
346	2,989	.....	.....	.....	394	576	.....	49	.....	.....	62	.....	.....	10	.....
7	119	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
137	2,005	.....	.....	96	165	360	17	23	.....	.....	.....	.....	.....	.....	.....
19	203	22	.....	.....	25	50	.....	.....	.....	.....	.....	.....	52	.....	.....
23,918	$285,889	$4,033	$55,102	$7,516	26,598	$51,092	$99	$17,988	$14,208	$5,183	$23,086	$1,443	$23,224	$7,078	$20,100
6,958	$80,992	$126	$4,217	.....	7,060	$9,251	$17	$1,693	.....	.....	$106	$2,525	$4,883	.....	$45
8	191	.....	.....	.....	4	10	.....	.....	.....	.....	.....	.....	6	.....	291
3,844	45,457	.....	139	.....	90	134	.....	800	.....	.....	427	.....	529	.....	996
818	13,422	73	2,651	$1,525	884	1,791	.....	27	.....	$806	.....	41	275	.....	233
621	8,283	4	1,629	464	1,089	1,973	.....	80	.....	.....	.....	80	778	$10	160
130	2,488	.....	.....	.....	110	261	.....	78	.....	.....	.....	.....	94	.....	126
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	255	.....	.....	.....	10	37	.....	.....	.....	.....	.....	.....	47	.....	.....
29	317	.....	.....	.....	16	29	.....	10	.....	.....	.....	.....	.....	.....	.....
12	97	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	.....	.....
1,788	24,835	.....	1,435	.....	2,094	3,947	.....	209	.....	.....	.....	81	8	.....	140
717	8,673	.....	170	.....	641	990	.....	426	.....	.....	499	.....	259	.....	125
1,370	14,400	14	673	.....	1,415	2,418	16	224	.....	268	130	554	527	.....	276
16,299	$199,410	$217	$10,914	$1,989	13,413	$20,841	$33	$3,547	.....	$1,074	$1,162	$3,281	$7,425	$10	$2,392
55	$604	.....	.....	.....	90	$120	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,443	15,021	$1,400	$4,722	$5,802	971	3,247	$519	$344	.....	.....	$71	$148	$112	.....	$592
141	1,346	.....	52	.....	12	81	.....	20	$110	.....	.....	.....	20	.....	.....
625	6,370	140	1,666	.....	475	538	.....	.....	.....	.....	.....	.....	.....	.....	30
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,037	14,677	.....	228	39	793	1,324	.....	139	36	$95	53	176	492	433	118
.....	.....	.....	.....	.....	.....	.....	.....	.....	19	.....	.....	.....	29	.....	.....
291	6,240	.....	5,153	1,154	702	1,655	.....	285	.....	.....	.....	.....	100	.....	1,052
24	263	.....	1,892	293	50	102	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
89	1,489	.....	.....	.....	41	65	.....	.....	.....	.....	22	.....	136	190	.....
6,611	67,924	11,315	41,098	.....	6,501	12,079	1,622	11	.....	.....	331	.....	2,045	2,327	.....
130	1,256	.....	.....	.....	169	283	.....	.....	.....	.....	.....	.....	.....	.....	.....
147	2,030	.....	.....	.....	177	308	.....	.....	.....	.....	.....	.....	61	.....	.....
3,355	43,299	778	15,005	7,291	2,467	5,201	31	412	.....	26	16	424	804	.....	260
102	990	.....	116	.....	78	108	.....	.....	.....	.....	.....	.....	55	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	.....	.....
14,050	$161,509	$13,633	$69,932	$14,579	12,526	$25,111	$2,172	$1,211	$165	$121	$493	$748	$3,929	$2,950	$2,052

Exports of India Rubber Manufactures from the

EXPORTED TO OCEANIA	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Waterproofed Auto Cloth Value	Waterproofed Clothing Value
Australia	$13,068	$3,879	$4,784	.....	95	$450	1,584	$730	2,881	$2,004	.....	$21,307	$872
British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	456	580	.....	.....	.....
New Zealand	24	170	499	.....	797	2,484	.....	.....	.....	.....	$445	1,091	.....
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	24	28	.....	.....	.....
TOTALS, OCEANIA	$13,092	$4,049	$5,283	.....	892	$2,934	1,584	$730	3,361	$2,612	$445	$22,398	$872
AFRICA													
British West Africa	$189	.....	.....	.....	.....	.....	108	$348	.....	.....	.....	.....	.....
British South Africa	7,296	$4,342	$107	.....	.....	.....	360	218	444	$403	$35	$1,702	$2,062
British East Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	116	.....	.....
Canary Islands	.....	26	.....	.....	.....	.....	.....	.....	.....	.....	40	.....	.....
Egypt	.....	232	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Algeria and Tunis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morocco	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	59	.....	86	.....	.....	.....	.....	.....	48	52	155	.....	.....
Other Portuguese Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, AFRICA	$7,544	$4,600	$193	.....	.....	.....	468	$566	492	$455	$346	$1,702	$2,062
GRAND TOTALS	$181,005	$155,053	$76,004	$97,524	19,628	$55,088	47,272	$38,858	494,019	$378,577	$72,116	$132,514	$119,760

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	February, 1924 Pounds	February, 1924 Value	Eleven Months Ended February, 1924 April-February Pounds	Eleven Months Ended February, 1924 April-February Value
UNMANUFACTURED Rubber, gutta percha, etc.,				
From United Kingdom	464,390	$160,352	4,081,029	$1,277,057
United States	1,566,917	389,301	16,826,908	4,590,763
Belgium	.....	.....	.....	.....
Brazil	.....	.....	.....	.....
Dutch East Indies	.....	.....	.....	.....
Ceylon	.....	.....	.....	.....
Straits Settlements	226,033	58,963	4,010,805	1,169,740
Dutch East Indies	.....	.....	202,112	52,102
France	.....	.....	4,624	1,163
Other countries	.....	.....	116,052	27,536
Totals	2,257,340	$608,616	25,241,530	$7,118,361
Rubber recovered	127,836	$10,956	2,321,979	$218,787
Rubber, powdered and rubber or gutta percha scrap	414,970	14,906	3,240,568	118,382
Balata	414	331	7,493	6,527
Rubber substitutes	27,780	9,554	714,563	136,125
Totals	$71,000	$35,747	6,284,603	$479,821
PARTLY MANUFACTURED				
Hard rubber sheets and rods	37,491	$18,171	135,104	$83,253
Hard rubber tubes	.....	231	.....	16,946
Rubber thread, not covered	8,863	9,336	76,948	84,916
Totals	46,354	$27,738	212,052	$185,115
MANUFACTURED				
Belting	.....	$11,745	.....	$131,456
Hose	.....	6,827	.....	110,568
Packing	.....	3,511	.....	44,003
Boots and shoes, pairs	6,228	7,633	132,213	185,656
Clothing, including waterproofed	.....	12,449	.....	164,216
Gloves	.....	945	.....	15,066
Hot water bottles	.....	3,142	.....	25,201
Tires, solid, number	2,176	10,795	22,579	86,190
Tires, pneumatic, number	4,141	40,560	70,773	744,494
Inner tubes, number	2,460	3,471	34,980	52,364
Elastic, round or flat	.....	23,174	.....	253,188
Mats and matting	.....	751	.....	16,254
Cement	.....	2,833	.....	40,391
Other rubber manufactures	.....	102,343	.....	1,298,061
Totals	.....	$230,179	.....	$3,167,108
Totals, rubber imports	.....	$902,280	.....	$10,950,405

Exports of Domestic and Foreign Rubber Goods

	February, 1924 Produce of Canada Value	February, 1924 Re-exports of Foreign Goods Value	Eleven Months Ended February, 1924 April-February Produce of Canada Value	Eleven Months Ended February, 1924 April-February Re-exports of Foreign Goods Value
UNMANUFACTURED Crude and waste rubber	$5,573	$188	$54,275	$63,997
Totals	$5,573	$188	$54,275	$63,997
MANUFACTURED				
Belting	$21,905	.....	$235,299	.....
Canvas shoes with rubber soles	103,423	.....	1,070,039	.....
Boots and shoes	45,205	.....	611,059	.....
Clothing, including waterproofed	1,791	.....	16,092	.....
Hose	5,858	.....	118,479	.....
Tires, casings	337,431	.....	5,125,655	.....
Inner tubes	45,579	.....	560,690	.....
Pneumatic	.....	.....	.....	.....
Solid	21,223	.....	147,474	.....
Vehicle	.....	.....	.....	$8,462
Other rubber manufactures	20,669	$1,681	235,333	33,474
Totals	$603,084	$1,681	$8,120,120	$41,936
Totals, rubber exports	$608,657	$1,869	$8,174,395	$105,933

British Malaya Rubber Exports

An official cablegram from Singapore states that the gross exports of rubber from British Malaya in the month of April amounted to 20,551 tons. The amount of rubber imported was 7,909 tons, so that net exports amounted to 12,642 tons, as compared with 18,619 tons in the corresponding month of last year. Appended are the comparative statistics:

	1923 Gross Tons Export	1923 Net Tons Export	1924 Gross Tons Export	1924 Net Tons Export
January	22,871	18,513	23,848	14,981
February	19,907	15,818	19,395	11,955
March	23,646	18,538	22,294	14,025
April	24,008	18,619	20,551	12,642
Total	90,432	71,488	86,088	53,603

United States Crude and Waste Rubber Imports for 1924 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Total 1924	Total 1923	Balata	Miscellaneous	Waste
January, tons	20,611	731	181	88	.....	.....	21,611	31,197	23	249	95
February	29,977	1,501	192	93	.....	.....	31,763	24,220	47	799	53
March	16,009	980	663	33	67	.....	17,752	33,916	86	98	184
April	41,438	686	139	9	164	.....	42,436	31,588	55	1,371	114
Totals, 4 months, 1924, tons	108,035	3,898	1,175	223	231	.....	113,562	.....	211	2,517	446
Totals, 4 months, 1923	112,764	5,814	1,998	203	142	.....	.....	120,921	253	2,896	2,436

Compiled from Rubber Association figures.

United States by Countries During March, 1924—*Continued*

Pneumatic Casings			Solid Tires		Pneumatic Tubes				Hard Rubber Goods						
Automobile			Automobile and Motor Truck		Automobile										
Number	Value	Others Value	Value	Others Value	Number	Value	Others Value	Tire Repair Materials Value	Battery Jars and Accessories Value	Other Electrical Supplies Value	Others Value	Rubber Water Bottles and Fountain Syringes Value	Druggists' Rubber Sundries Value	Bathing Caps Value	Rubber Toys, Balls and Balloons Value
2,757	$33,658	$232	$36,763	$2,639	2,744	$5,364	$85	$2,458	$150	$63	.....	178	$2,230	.....	$595
7	134	.....	.....	.....	.....	.....	.....	46	.....	.....	.....	.....	.....	.....	.....
2,069	32,799	.....	13,698	104	2,141	3,739	.....	2,302	.....	.....	.....	579	264	.....	814
10	135	15	.....	.....	20	35	16	18	3	.....	.....	.....	.....	.....	.....
4,843	$66,726	$247	$50,461	$2,743	4,905	$9,138	$101	$4,824	$153	$65	.....	$757	$2,494	.....	$1,409
272	$4,540	.....	.....	.....	306	$695	.....	$48	.....	.....	.....	.....	.....	.....	.....
533	6,702	.....	$476	.....	164	289	.....	961	.....	.....	$89	.....	$165	$204	$2,202
372	3,936	.....	814	.....	355	551	.....	.....	.....	.....	.....	.....	.....	.....	47
211	2,821	.....	972	.....	169	219	.....	.....	.....	.....	.....	.....	.....	.....	.....
345	2,399	$9	922	$1,477	330	363	.....	386	.....	.....	.....	.....	.....	.....	427
.....	.....	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	100	.....
.....	.....	.....	.....	.....	.....	.....	.....	297	.....	.....	.....	.....	.....	.....	.....
80	2,260	.....	.....	.....	166	738	.....	.....	.....	.....	.....	.....	.....	.....	.....
24	375	.....	.....	.....	44	96	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	117	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,837	$23,033	$25	$3,301	$1,477	1,534	$2,951	.....	$1,692	.....	.....	$89	.....	$186	$304	$2,676
102,240	$1,154,201	$21,382	$285,975	$28,304	97,338	$161,636	$3,125	$37,600	$14,711	$10,727	$52,726	$8,466	$63,519	$49,281	$80,244

United Kingdom Rubber Statistics

Imports

UNMANUFACTURED	March, 1923		March, 1924	
Crude rubber From—	Pounds	Value	Pounds	Value
Straits Settlements	6,641,800	£428,736	4,520,800	£274,944
Federated Malay States	3,702,900	234,810	2,781,600	174,557
British India	1,146,000	78,098	913,200	55,592
Ceylon and Dependencies	1,808,300	121,484	1,755,600	107,354
Other Dutch Possessions in Indian Seas	193,800	13,905	249,500	14,824
Dutch East Indies (except Other Dutch Possessions in Indian Seas)	901,000	57,225	1,531,300	98,574
Other Countries in East Indies and Pacific, not elsewhere specified	159,000	10,690	49,400	2,470
Brazil	516,000	29,416	808,500	39,750
Peru	.....	.....	.....	.....
South and Central America (except Brazil and Peru)	.....	.....	29,900	1,453
West Africa:				
French West Africa	271,300	13,846	195,600	9,292
Gold Coast	.....	.....	14,300	727
Other parts of West Africa	69,700	2,307	46,500	2,288
East Africa, including Madagascar	97,000	5,573	83,100	4,295
Other countries	43,100	2,310	47,100	2,784
Totals	15,549,900	£998,400	13,026,400	£788,904
Waste and reclaimed rubber	85,000	1,108	611,200	5,838
Gutta percha and balata	899,200	117,513	775,600	106,260
Rubber substitutes	.....	.....	.....	.....
Totals	16,534,100	£1,117,021	14,413,200	£901,002
MANUFACTURED				
Boots and shoes...*doz. pairs*	23,701	£36,388	20,891	£42,139
Tires and tubes				
Pneumatic				
Outer covers	.....	339,204	.....	170,793
Inner tubes	.....	32,833	.....	30,520
Solid tires	.....	19,420	.....	31,310
Other rubber manufactures	.....	95,372	.....	94,225
Totals	.....	£523,217	.....	£368,987

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	586,400	£8,345	564,300	£5,296
Rubber substitutes	61,400	1,467	76,100	2,234
Totals	647,800	£9,812	640,400	£7,530
MANUFACTURED				
Boots and shoes...*doz. pairs*	14,269	£22,876	22,875	£31,712
Tires and tubes				
Pneumatic				
Outer covers	.....	128,285	.....	160,771
Inner tubes	.....	27,146	.....	27,214
Solid tires	.....	18,577	.....	24,941
Other rubber manufactures	.....	239,884	.....	200,268
Totals	.....	£436,768	.....	£444,906

Exports—Colonial and Foreign

UNMANUFACTURED	March, 1923		March, 1924	
Crude rubber To—	Pounds	Value	Pounds	Value
Russia	.....	.....	.....	.....
Sweden, Norway and Denmark	202,400	£13,567	144,600	£8,391
Germany	1,052,400	69,481	1,376,800	84,683
Belgium	355,800	25,516	559,500	33,623
France	2,834,100	207,002	3,205,100	174,330
Spain	25,700	1,833	120,300	6,838
Italy	644,900	42,869	898,300	49,939
Austria	.....	.....	158,200	9,144
Hungary	45,100	3,421	.....	.....
Other European countries	144,600	9,920	170,300	10,741
United States	9,171,600	657,838	5,853,300	329,527
Canada	735,600	52,518	1,102,500	69,900
Other countries	39,200	1,968	106,000	5,833
Totals	15,251,400	£1,085,933	13,694,900	£782,949
Waste and reclaimed rubber	48,500	505	4,700	137
Gutta percha and balata	88,600	14,017	50,400	5,713
Rubber substitutes	2,000	20	.....	.....
Totals	15,390,500	£1,100,475	13,750,000	£788,799
MANUFACTURED				
Boots and shoes...*doz. pairs*	63	£240	629	£753
Tires and tubes				
Pneumatic				
Outer covers	.....	5,091	.....	49,430
Inner tubes	.....	512	.....	2,632
Solid tires	.....	765	.....	1,615
Other rubber manufactures	.....	3,298	.....	5,250
Totals	.....	£9,906	.....	£59,680

Imports of Crude Rubber Into the United States by Customs Districts

	March, 1923		March, 1924	
	Pounds	Value	Pounds	Value
Massachusetts	3,055,799	$1,029,947	936,025	$229,222
New York	65,066,720	17,710,328	44,295,637	11,112,124
Philadelphia	.....	.....	671,920	164,574
Maryland	56,000	16,927	224,005	57,681
El Paso	56,010	11,202	.....	.....
Los Angeles	465,407	100,879	250,819	58,656
Oregon	.....	.....	56,000	15,784
San Francisco	524,770	161,313	.....	.....
Colorado	56,000	10,969	.....	.....
Hawaii	.....	.....	70	21
	69,280,706	$19,041,565	46,434,476	$11,638,062

ALTHOUGH THE UNITED STATES EXPORTED DURING THE YEAR 1923 more than 3,500,000 pounds of rubber belting, her imports of such goods during the eight months ended February 29, 1924, were estimated at 417,927 pounds, value $237,278. The February purchase alone amounted to 56,425 pounds, value $41,385.

Crude Rubber Arrivals at New York as Reported by Importers

Parás and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Cametá Cases
APRIL 18. By "Denis," Brazil.					
H. A. Astlett & Co.	‡300	...	...	...	...
General Rubber Co.	73	6	4	3	...
L. Littlejohn & Co., Inc.	182	81	219	333	...
Poel & Kelly, Inc.	120	39	24	32	...
Ultramares Corp.	...	...	90	100	...
MAY 5. By "Bernini," Brazil.					
Paul Bertuch	...	...	...	64	...
General Rubber Co.	538	25	168	368	...
L. Littlejohn & Co., Inc.	187	25	134	204	...
Meyer & Brown, Inc.	533	...	274	219	...
Poel & Kelly, Inc.	70	82	175	65	...
Ultramares Corp.	...	...	...	96	...
MAY 9. By "Cuthbert," Brazil.					
H. A. Astlett & Co.	‡146	...	...	...	...
General Rubber Co.	572	13	225	13	...
L. Littlejohn & Co., Inc.	99	38	55	700	...
Poel & Kelly, Inc.	62	...	...	65	...
Ultramares Corp.	2	...	5	25	...

‡Washed and dried in Brazil.

Plantations

APRIL 11. By "Nile," Padang.
Poel & Kelly, Inc. *156 cases

APRIL 13. By "Kendal Castle," Singapore.
F. R. Henderson & Co., Inc. 100 cases

APRIL 15. By "Ansonia," Liverpool.
Poel & Kelly, Inc. 983 cases

APRIL 16. By "Albanian," London.
General Rubber Co. 1,593 cases

APRIL 19. By "Belgian," London.
General Rubber Co. 1,165 cases

APRIL 20. By "Nevisian," London.
General Rubber Co. 474 cases
F. R. Henderson & Co., Inc. 81 cases
L. Littlejohn & Co., Inc. 333 cases

APRIL 23. By "American Farmer," London.
F. R. Henderson & Co., Inc. 237 cases

APRIL 24. By "Malakutta," Far East.
L. Littlejohn & Co., Inc. 280 cases
Meyer & Brown, Inc. 974 cases
Poel & Kelly, Inc. 2,479 cases

APRIL 24. By "Robert Dollar," Far East.
H. A. Astlett & Co. 630 cases
Baird Rubber & Trading Co., Inc. 1,120 cases
General Rubber Co. 449 cases
Hood Rubber Co. *728 cases
J. T. Johnstone & Co., Inc. 201 cases
L. Littlejohn & Co., Inc. 5,759 cases
Meyer & Brown, Inc. 1,976 cases
Poel & Kelly, Inc. 1,558 cases
Vernon Metal & Produce Co., Inc. 401 cases
Chas. T. Wilson Co., Inc. 1,949 cases

APRIL 25. By "Eurybates."
H. A. Astlett & Co. 3,386 cases
H. A. Astlett & Co. *112 cases
Baird Rubber & Trading Co., Inc. 1,768 cases
Paul Bertuch 300 cases
General Rubber Co. 5,960 cases
F. R. Henderson & Co., Inc. 412 cases
Hood Rubber Co. *517 cases
J. T. Johnstone & Co., Inc. 1,552 cases
L. Littlejohn & Co., Inc. 7,733 cases
Meyer & Brown, Inc. 2,668 cases
Poel & Kelly, Inc. 6,079 cases
Fred Stern & Co., Inc. 1,144 cases
Vernon Metal & Produce Co., Inc. 1,160 cases
Chas. T. Wilson Co., Inc. 528 cases

APRIL 26. By "Ixion," Far East.
H. A. Astlett & Co., Inc. 1,158 cases
Baird Rubber & Trading Co., Inc. 1,872 cases
Baird Rubber & Trading Co., Inc. *100 cases
General Rubber Co. 4,078 cases
F. R. Henderson & Co., Inc. 245 cases
J. T. Johnstone & Co., Inc. 1,445 cases
Meyer & Brown, Inc. 1,915 cases
Poel & Kelly, Inc. 5,907 cases
L. Littlejohn & Co., Inc. 5,852 cases
Fred Stern & Co., Inc. 1,374 cases
Vernon Metal & Produce Co., Inc. 1,229 cases
Chas. T. Wilson Co., Inc. 1,656 cases

APRIL 26. By "President Hayes," Far East.
H. A. Astlett & Co. 195 cases
General Rubber Co. 448 cases
Hood Rubber Co. *537 cases
J. T. Johnstone & Co., Inc. 28 cases
L. Littlejohn & Co., Inc. 1,897 cases
Meyer & Brown, Inc. 1,260 cases
Poel & Kelly, Inc. 946 cases
Chas. T. Wilson Co., Inc. 132 cases

APRIL 26. By "Sarcoxie," Far East.
Poel & Kelly, Inc. 206 cases

APRIL 28. By "Minnewaska," London.
F. R. Henderson & Co., Inc. 137 cases
L. Littlejohn & Co., Inc. 683 cases

APRIL 28. By "Montgomery City," Far East.
H. A. Astlett & Co. 130 cases
L. Littlejohn & Co., Inc. 250 cases
Meyer & Brown, Inc. 285 cases
Poel & Kelly, Inc. 1,324 cases
Chas. T. Wilson Co., Inc. 100 cases

APRIL 28. By "Poleric," Far East.
Baird Rubber & Trading Co., Inc. 668 cases
Meyer & Brown, Inc. 367 cases
L. Littlejohn & Co., Inc. 1,704 cases
Poel & Kelly, Inc. 46 cases
Fred Stern & Co., Inc. 63 cases
Chas. T. Wilson Co., Inc. 508 cases

APRIL 28. By "West Canon," Far East.
H. A. Astlett & Co. 340 cases
General Rubber Co. 3,024 cases
F. R. Henderson & Co., Inc. 300 cases
L. Littlejohn & Co., Inc. 1,858 cases
Meyer & Brown, Inc. 204 cases
Poel & Kelly, Inc. 730 cases
Vernon Metal & Produce Co., Inc. 105 cases
Chas. T. Wilson Co., Inc. 144 cases

APRIL 29. By "American Shipper," London.
F. R. Henderson & Co., Inc. 95 cases

APRIL 29. By "Gothic Prince," Far East.
H. A. Astlett & Co. 1,109 cases
Baird Rubber & Trading Co., Inc. 530 cases
Baird Rubber & Trading Co., Inc. *100 cases
Paul Bertuch 100 cases
General Rubber Co. 896 cases
Hood Rubber Co. *127 cases
J. T. Johnstone & Co., Inc. 522 cases
L. Littlejohn & Co., Inc. 5,178 cases
Meyer & Brown, Inc. 1,123 cases
Poel & Kelly, Inc. 4,092 cases
Fred Stern & Co., Inc. 477 cases
Vernon Metal & Produce Co., Inc. 960 cases
Chas. T. Wilson Co., Inc. 100 cases

MAY 1. By "Half Moon," Far East.
H. A. Astlett & Co. 209 cases
Baird Rubber & Trading Co., Inc. 326 cases
General Rubber Co. 3,024 cases
J. T. Johnstone & Co., Inc. 178 cases
L. Littlejohn & Co., Inc. 3,674 cases
Meyer & Brown, Inc. 195 cases
Poel & Kelly, Inc. 1,160 cases
Poel & Kelly, Inc. ‡17 cases
Fred Stern & Co., Inc. 195 cases
Chas. T. Wilson Co., Inc. 569 cases

MAY 1. By "Virgilia," London.
Paul Bertuch 96 cases

MAY 1. By "Wray Castle," Far East.
Baird Rubber & Trading Co., Inc. 260 cases
Paul Bertuch 280 cases
General Rubber Co. 3,814 cases
J. T. Johnstone & Co., Inc. 80 cases
L. Littlejohn & Co., Inc. 5,386 cases
Meyer & Brown, Inc. 1,235 cases
Poel & Kelly, Inc. 4,724 cases
Vernon Metal & Produce Co., Inc. 180 cases

MAY 7. By "American Trader," London.
H. A. Astlett & Co. 136 cases

MAY 7. By "City of Auckland," Far East.
Baird Rubber & Trading Co., Inc. 112 cases
Paul Bertuch 112 cases
L. Littlejohn & Co., Inc. 490 cases
Meyer & Brown, Inc. 1,015 cases
Poel & Kelly, Inc. 1,003 cases
Fred Stern & Co., Inc. 112 cases
Chas. T. Wilson Co., Inc. 112 cases

MAY 11. By "Menominee," London.
J. T. Johnstone & Co., Inc. 69 cases

MAY 11. By "Romeo," Far East.
Baird Rubber & Trading Co., Inc. 56 cases
Paul Bertuch 112 cases
General Rubber Co. 2,750 cases
Hood Rubber Co. *280 cases
L. Littlejohn & Co., Inc. 369 cases
Meyer & Brown, Inc. 168 cases
Poel & Kelly, Inc. 1,430 cases

MAY 12. By "Cedric," London.
General Rubber Co. 762 cases

MAY 12. By "Croxteth Hall," Far East.
L. Littlejohn & Co., Inc. 386 cases
Poel & Kelly, Inc. 70 cases

MAY 12. By "Lancastria," London.
Paul Bertuch 107 cases
L. Littlejohn & Co., Inc. 3,188 cases
Poel & Kelly, Inc. 3,200 cases

MAY 12. By "Minnetonka," London.
Paul Bertuch 99 cases
General Rubber Co. 5,529 cases
F. R. Henderson & Co., Inc. 49 cases

MAY 16. By "City of Manila," Far East
General Rubber Co. 3,288 cases
Hood Rubber Co. *692 cases
J. T. Johnstone & Co., Inc. 456 cases
L. Littlejohn & Co., Inc. 3,810 cases
Meyer & Brown, Inc. 1,409 cases
Fred Stern & Co., Inc. 83 cases

MAY 18. By "Kabinga," Singapore.
J. T. Johnstone & Co., Inc. 799 cases
L. Littlejohn & Co., Inc. 8,755 cases

MAY 18. By "Steel Worker," Far East.
L. Littlejohn & Co., Inc. 462 cases
Fred Stern & Co., Inc. 320 cases

MAY 20. By "Veendyk," Batavia.
J. T. Johnstone & Co., Inc. 331 cases
Fred Stern & Co., Inc. 100 cases

MAY 20. By "West Calumb," Singapore.
Fred Stern & Co., Inc. 200 cases

* Arrived at Boston. ‡ Penang.

Africans

APRIL 15. By "Ansonia," Liverpool.
Poel & Kelly, Inc. 973 packages

MAY 8. By "Roussillon," Bordeaux.
Poel & Kelly, Inc. 417 bales

MAY 12. By "Lancastria," Liverpool.
Poel & Kelly, Inc. 336 bales

Balata

APRIL 17. By "Mayaro," Ciudad Bolivar.
Ultramares Corp. 106 bales

MAY 5. By "Bernini," Manaós.
Paul Bertuch 6 cases

MAY 7. By "Surinam," French Guiana.
Middleton & Co., Ltd. 34 bales

MAY 9. By "Cuthbert," Iquitos.
H. A. Astlett & Co. 171 cases
Ultramares Corp. 35 cases

Guayule

APRIL 26-MAY 18. By "Railways," Mexico.
Continental Rubber Co. 3,180 cases

Gutta Percha

APRIL 26. By "Ixion," Singapore.
Poel & Kelly, Inc. 12 cases

Maniçobas

APRIL 22. By "Scythia," Liverpool.
H. A. Astlett & Co. 63 cases

APRIL 28. By "Franconia," Liverpool.
H. A. Astlett & Co. 112 cases

Rubber Latex

MAY 1. By "Half Moon," Far East.
General Rubber Co. 90,753 pounds

Sole Crêpe

APRIL 23. By "Winifredian," London.
Meyer & Brown, Inc. 78 cases

Russian Rubber Industry Under Soviet Rule

Factories Nationalized—Labor, Materials and Equipment Lacking—The Russian Rubber Trust—Plants Operating at Loss—Need of Efficient Management

FROM data mainly obtained through official sources it has been possible to draw a sufficiently accurate picture of the vicissitudes of the rubber industry during the last five years.

The Russian rubber industry was formerly owned by foreign capital until the establishment of Soviet rule, when the factories were expropriated and nationalized. In spite of the war, the industry had up to this time been able to function fairly well, but rapid disintegration followed in the wake of Soviet government.

Lack of Raw Materials

The blockade, begun in the spring of 1918, cut off all supplies of raw material. Later on, the occupation of the oil territories in the Caucasus by the British and Turks prevented the factories from obtaining benzine. The disorganization of all means of transportation due to the counter-revolution added a shortage of fuel and grain to all the other troubles. Small wonder, then, that by November, 1919, all factories were idle.

However, things began to mend by the beginning of 1920. There was a great need of rubber goods in the country and measures were taken to supply the factories with labor, raw material, fuel, and electric power. On January 1, 1920, the supplies on hand were said to have included 126,000 pood[1] of crude rubber, 194,000 pood old rubber, 55,000 pood asbestos, 107,000 pood flowers of sulphur, 165,000 pood chalk and powders, 230,000 pood other ingredients, 1,000,000 arshine[1] tire fabric, enough for 6 to 8 months.

Inefficient Equipment and Labor

Thus gradually the factories began to work again, but progress was slow owing to damage to equipment and inefficient labor. But matters began to improve when labor was better fed and new arrangements regarding wages were made, so that finally the production for the year worked out as follows:

		1920	
		First half	Second half
Footwear	*Pairs*	.....	10,200
Automobile tires, tubes and repairs	*Number*	31,100	34,500
Belting	*Arshine*	146,900	292,700
Hose	*Arshine*	46,100	60,600
Technical goods	*Pood*	3,900	4,500
Sole sheets	*Pood*	12,600	62,000
Surgical goods	*Number*	223,700	1,287,000
Ebonite goods	*Pood*	600	1,500
Accumulator reservoirs	*Number*	51,600	.....
Rubberized fabric	*Square arshine*	50	40
Asbestos goods	*Pood*	9,300	14,300
Rubberized packing	*Pood*	6,500	4,400

During 1920 an experiment station for synthetic rubber was also established, of which great things were expected.

The Russian Rubber Trust

In 1921 there were 5,785 laborers and 1,345 officials employed in the rubber industry. Seven factories were now supplied, these forming the so-called trust. The factories and locations are as follows: No. 1, Treugolnik, Petrograd; No. 2, Bogatyr, Moscow-Bogorodsk; No. 3, Kautschuk, Moscow; No. 4, Prowodnik; No. 5, Tuschina, and No. 6, Beresslawl-Salesek, formerly belonged to Prowodnik, Moscow. Information regarding the seventh is not given. No. 1 and No. 2 manufacture chiefly rubber shoes; No. 3, surgical goods; No. 4, rubberized materials; No. 6, asbestos packing, oilcloth, linoleum, and the like.

Erratic Progress

Progress during 1921 was erratic; production was interrupted owing to shortage of raw material, and suffered because of lack of skilled labor, particularly technical men. Figures for six months only are available. These show marked increase in output of shoes and rubberized fabrics, but little advance in the output of tires and surgical goods.

For 1922 complete figures are lacking, only those for the last quarter being published. However, production seems to have continued to increase during the year, judging from the fact that on January 1, 1923, there were 12,633 persons employed in the rubber factories, the Treugolnik alone giving occupation to 8,100 persons. But 1923 saw a fall in output, particularly of tires, rubberized fabrics, belting and technical goods and with this decrease also a reduction in the number of employes, which was only 10,500 in April, while the number of working days in that month was cut 20 per cent. In fact, only three factories seem to have been working during that month. In May there was a slight improvement, but in June the situation was again as bad as ever.

Production Figures Unfavorable

Comparing the available figures from 1920 on, we find that the output of the main articles was as follows:

	Unit	1920 Entire year	1921 First half	1922 Fourth quarter	1923 First half
Rubber shoes	*Pair*	10,200	125,200	3,103,000	4,800,000
Tires	*Number*	65,600	296,800	70,000	205,000
Rubberized fabrics	*Sq. arshine*	100	71,700	90,000	340,000
Asbestos goods	*Pood*	24,000	6,000	2,850	19,000
Other rubber goods	*Pood*	.....	.....	7,032	20,000

The production in the first half of 1923, month by month, follows:

	Unit	January	February	March	April	May	June
Rubber shoes	*pair*	784,600	1,047,500	955,000	832,400	....	485,000
Tires	*number*	58,700	62,200	26,800	19,900	....	19,400
Rubberized fabrics,	*Sq. arshine*	64,100	73,500	53,300	58,200	....	.....
Asbestos goods	*pood*	2,900	3,770	3,680	3,380	....	.....
Other rubber goods	*pood*	4,140	4,207	3,756	3,112	....	.....
Value in gold rubles at pre-war prices		5,000,000	5,900,000	3,476,300	3,243,800	3,366,000	2,212,000

Better Management Needed

At present, the industry appears to be attempting to improve conditions by employing foreign technical men and experts, and by better management. That this is badly needed is evident from sketches of Soviet Russia by a certain Sosnowski. He says of conditions in the Bogatyr works after the government had taken them over that the amount of stealing was unbelievable; there were no fewer than 700 unproductive employes or officials, against 1,200 productive workers; consumption of fuel was out of all proportion to the production; quality was very inferior; the distributing system did not function properly, and much needed supplies of raw, half-finished, and finished materials were left to spoil in the store houses. Conditions grew steadily worse so that by the middle of 1921 the factory was about to be closed.

However, instead, persons with organizing talent were taken from the Red Army, and one Murat, who knew nothing whatever about manufacturing, was made manager of Bogatyr. He seems to have had common sense and by ordering certain repairs and enforcing discipline, soon increased production 100 per cent with 40 per cent fewer workers. Murat is at present at the head of the Russian rubber industry.

It had been officially planned to give concessions to foreigners for manufacturing rubber in Russia, but this scheme was eventually defeated by the new captains of the industry.

[1] Pood equals 36 pounds; arshine 28 inches.

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Our Publicity Page

Reading the Pulse of THE INDIA RUBBER WORLD

OUR daily mail is the pulse of THE INDIA RUBBER WORLD. It is the return wire of the circuit of mutual helpfulness which we aim to maintain unbroken between it and its readers and advertisers throughout the trade. It keeps us in touch with their aspirations and needs that we may do our share in turning the wheel of progress. It tells us what is liked and disliked about THE INDIA RUBBER WORLD and contains many welcome constructive suggestions which help us to make a more serviceable paper. It brings us letters of commendation and encouragement, and also material support in the form of subscriptions and advertising contracts. It is the very life blood of the paper and the measure of its success.

Once in a while we take a pardonable pride in sharing some of our letters with our friends because they express honest appreciation of the service we are rendering. Adverse criticism there may be, but it rarely reaches us. Such letters of this sort as do come in are usually published in the column maintained for "Interesting Letters from Our Readers," especially if they are constructive and of general interest.

Constant General Praise

Letters of general praise, such as the following, we are pleased to state, are constantly being received. We quote from only two recent examples, one accompanying a renewal and the other a new subscription.

The McQuate Rubber Co., Marion, Ohio, writes:

We have heard considerable comments on THE INDIA RUBBER WORLD from various other manufacturers, therefore would be pleased to receive yearly subscription.

A. H. Sommers, Memphis, Tennessee, writes:

Think your journal best to be had or read covering rubber.

Specific Praise As Well

Letters of specific praise and constructive helpfulness regarding our regular departments and special features are quite as frequent and even more welcome. Space permits quotation from only a few recent letters of this sort.

Results from New Goods and Machinery Items

These two regular departments afford manufacturers of novel products of and for the rubber trade an opportunity to introduce them free of charge. It is a get-together service of mutual benefit to producer and consumer.

The Constant Heat Pack Corporation, Albany, New York, writes:

We wish to extend our thanks for the valuable space you have given to the description of our product, which we are pleased to say has already resulted in our receiving several inquiries.

The New Haven Sherardizing Co., Hartford, Connecticut, writes:

May we thank you for the recent description of our mandrel product? We heartily agree that publishing such information not only helps us, but helps the trade, which is vitally interested in these various matters which appear in your paper.

Foreign Trade Results from Advertisements

The volume of our advertising bears eloquent testimony to the results being obtained in the United States and Canada. But THE INDIA RUBBER WORLD has subscribers in 120 other countries of the world, and frequent letters advise us of its order-producing value in many faraway places.

J. H. Sessions & Son, Bristol, Connecticut, writes:

We received an inquiry from South Africa for our rubber heel burrs, which was addressed in such a way that it showed that our advertisement in your journal was the means of our getting into touch with the inquiry, which has since developed into an order. We thought you would be interested in learning of this circumstance, as South Africa is quite a distance away.

That our Small Advertisement Department is read as carefully abroad as at home is shown by the following from the Plymouth Rubber Co., Inc., Canton, Massachusetts:

The writer wishes to state that he is very much pleased with the results of the small advertisement placed in THE INDIA RUBBER WORLD recently. We have already received two inquiries through your personal help, and we are astonished to receive an inquiry for friction tape and splicing compound from a rubber company in Switzerland.

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